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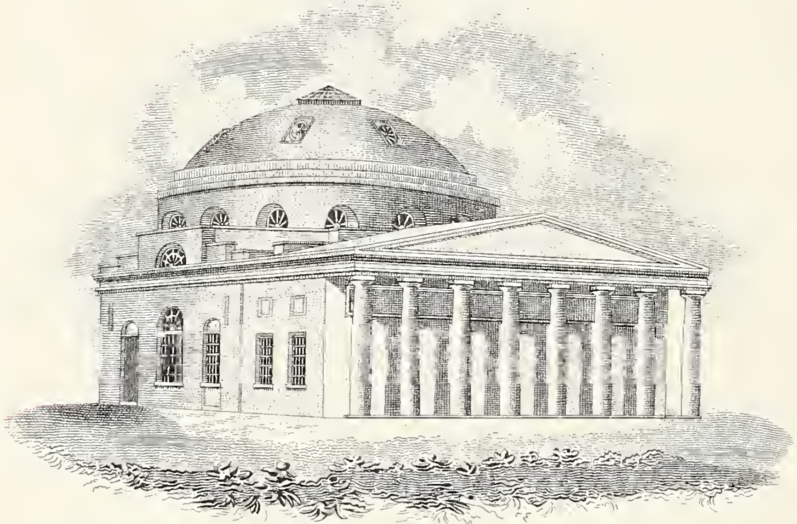

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MINNESOTA MEDICINE

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MINNESOTA MEDICINE

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THE TREATMENT OF THE COMMON COLD IN INFANTS AND CHILDREN*

ROGER L. J. KENNEDY, M.D.

Rochester, Minnesota

WHEN "the common cold" is mentioned before a group of physicians a clinical picture which is more or less similar is brought to the minds of the various listeners. That they will all entertain the same conception is, however, very unlikely. Certain physicians will visualize a process which involves only the nose: others, acute catarrh of the nasal and pharyngeal tissues. Still others will think of an inflammation of most of the upper part of the respiratory tract, including the nose, the accessory nasal sinuses, the pharynx, the larynx, the trachea, and the bronchi. In keeping with the effort which has been made in recent years to discard the term "cold," and to convey the meaning usually intended, the use of the term "infection of the upper part of the respiratory tract" is favored. It, therefore, seems wise to have the understanding that in infants and children, and perhaps in adults too, a cold may involve any or all of the component parts of the upper portion of the respiratory tract.

In consideration of the treatment of any disease the question of cause immediately arises. Logical therapeutic approach should consist of efforts to prevent entrance of the causative agent into the tissues of the organism, to increase the resistance of the organism to the attack of such agent or to destroy the agent if it has already invaded the tissues. At the present time, in spite of tremendous amounts of study and investigation, information regarding the agent or agents responsible for the common cold is relatively meager.

The belief that the common cold is due to bacteria such as the streptococcus, the pneumococcus, the bacillus of influenza, and the Micrococcus catarrhalis has changed to a belief that the etiologic agent is not a bacterium but a filtrable virus which may pass from one individual to another.[2] According to the newer ideas regarding the relation of bacteria to the common cold, however, the bacteria are not to be eliminated from the picture, but are to be regarded as secondary invaders and perhaps as playing the major etiologic rôle in the numerous complications of the common cold, which is produced by a virus.

Steps which may be taken to prevent the offending agent from reaching the organism are especially important in connection with young patients. It is generally agreed that infections of the upper part of the respiratory tract are serious in young individuals, and that the younger the child, the more frequent and dangerous are the complications. Although warnings have been issued regarding the contagiousness of colds, most lay people and indeed some physicians continue to disregard the rules of isolation which should be enforced in caring for any patient with a cold.

If thought is given to the meticulous care observed in isolating prematurely born infants from possible sources of infection and particularly from possible sources of infection of the upper part of the respiratory tract, the importance of isolation becomes evident. It is only too well appreciated that if a premature infant acquires a cold from exposure to an infected attendant, relative or family friend, the probabilities are very great that bronchopneumonia will follow and that the infant will die. If the patient is a mature infant or a young child, the chances that serious complications will develop are less but still are present.

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*From the Section of Pediatrics, The Mayo Clinic, Rochester, Minnesota. Read before the annual meeting of the Minnesota State Medical Association, Duluth, Minnesota, July 1, 1938.

The intimacy of contact accounts for the spread of a cold from one member of a family to the others. The difficulty of enforcing isolation under the conditions that exist in most homes frequently discourages the physician as well as the family from efforts to isolate the affected individual or individuals. Nevertheless, the necessity and importance of protecting young children, and particularly infants, remains as a responsibility of both physician and parents.

Obviously, the child who has an acute cold does not belong in school. For the sake of proper care of the affected child as well as for the protection of the well pupils, the place for such a child is at home in bed, removed from other members of the family. In spite of this, teachers and school nurses encounter not only lack of coöoperation but even active opposition on the part of the parents of many children whom they properly exclude from school during the acute stage of colds. One of the duties of the physician is to instruct his clientele in the necessity of caring for these children in the way best suited to their prompt recovery and to the safety of other members of the family and community.

Opinion is divided in respect to the use of vaccines for the prevention of colds. Some feel that vaccines definitely reduce the frequency of colds. Others believe that although the incidence of colds may not be reduced, the duration of colds is decreased. It is the opinion of others that the chief benefit to be derived from the use of vaccines is in the decreased incidence of complications. There are those, too, who have not been convinced that cold vaccines are of any value.

If it is true that colds are due to filtrable viruses (and there is considerable evidence to support such a view), it does not appear logical that they can be prevented by vaccines made from streptococci, pneumococci or the bacillus of influenza. It is conceivable, however, that such vaccines may protect individuals against the attack of these bacteria if they are secondary invaders or if they augment the filtrable virus in its invasive effects.

It is rather well accepted that the bacterial flora of the nose and throat vary in different epidemics of colds and that autogenous vaccines, therefore, are preferable to stock mixed vaccines which may contain none of the prevalent organisms or may contain so few that they can have no antigenic effect. Since the subject is controversial and since protection afforded by vaccines is far from 100 per cent, their use should be advised only with reservations. It should be definitely understood that protection is not certain.[6] The same statement applies to the use of filtrable viruses for protection.[5] A report dated January, 1938, from the Committee on Immunization Procedures of the American Academy of Pediatrics is of especial importance in this connection. In the report it was stated that there is no method for producing passive immunity for the common cold and that no active immune principle of any proved value has been described.[4]

A good deal has been said and written regarding the rôle of vitamins in the prevention of colds. Of the numerous vitamins known to exist, vitamin A has received the greatest amount of attention in respect to prophylaxis of colds. Unfortunately, some facts which are highly essential to an evaluation of vitamin A are not known. Knowledge of the optimal amount of the vitamin necessary to the well-being of the individual and the criteria for determining insufficiency of vitamin A in the body have not been definitely established. The fact that vitamin A is found so abundantly in so many foods makes it appear unlikely that any considerable proportion of the population suffers from vitamin A want. In infants and young children, whose diets may be restricted, such a want may conceivably be present. On the other hand, the widespread use of cod liver oil, which is a rich source of vitamin A (1 teaspoonful contains 2,500 units, the adequate dose is about 5,000 units) insures a generous intake for many infants. Nevertheless, even infants who receive this presumably adequate amount continue to have colds.

The active treatment of the acute cold consists of measures directed toward symptomatic relief. Of these, the one single measure regarding which there is entire agreement is rest in bed. This is not difficult to enforce in the case of infants, but if the patient is a child of the runabout age or of school age, it is frequently very difficult to keep him in bed. This treatment should be continued during the acute stage of the infection, particularly if there is fever.

A great variety of sedatives have been used for their general effect as well as for their specific effect on the cough. Among those which have a general effect codeine has been employed a great deal. In addition to the general quieting effect, it tends to control any bothersome cough. The combination of codeine and papaverine may be administered to older children. The barbiturates are probably second only to codeine in extent of use in acute colds. If the patient is an infant ⅛ to ¼ grain (0.008 to 0.016 gm.) of phenobarbital may be sufficient to control restlessness, but larger doses may be employed. When pain is present as it is in cases of otitis media, codeine, sodium amytal, or nembutal usually afford relief and promote rest.

Antipyretic measures are indicated in some cases. If restlessness, sleeplessness and fever are present, a warm bath, preferably a tub bath, will lower the temperature a degree or two, which is usually sufficient to induce sleep. The antipyretic effect of the bath may be supplemented by drugs. For this purpose the salicylates, particularly acetylsalicylic acid, have been most widely employed.

Adequate humidity of the air in the patient's room is desirable and for that reason some means of introducing additional moisture may be necessary in homes which are not equipped with humidifiers. A steam kettle is perhaps the simplest means at hand for this purpose. Some comment may be made upon the use of steam kettles. No good purpose is served by the introduction of such excessive amounts of steam into the room that window panes run with water and condensation takes place on everything in the room, including the bedclothes and the patient's clothes. No special benefit has been demonstrated as a result of confining an infant or child in a tent into which pours a steady cloud of steam. Most of the steam kettles in use today are heated by unprotected electric elements and are therefore sources of danger from fire. Not only this danger attends the use of the steam kettle, but there must be kept in mind the possibility of the kettle being upset by another member of the family, or indeed by the patient himself, and thus causing burns.

The use of medicines such as eucalyptus or compound tincture of benzoin in the steam kettle does not add to the benefits derived from the use of the steam.

The diet need not be changed from that ordinarily taken. In infants a reduction in the amount of food, and replacement of the withheld food by water may be indicated during the first twenty-four to forty-eight hours. Such a step may prevent a gastric upset but the restriction usually need not be continued beyond the second or third day of the cold.

One of the most widespread practices in the treatment of colds must be mentioned chiefly for the purpose of condemning it. This is the indiscriminate instillation of "drops" and the spraying of various agents into the noses of infants and children. It has not been demonstrated that nasal drops or nasal sprays have any beneficial effects so far as the infection is concerned. The argument that they are used to relieve congestion and obstruction becomes very much weakened if consideration is given to the facts that they are not required for this purpose in most instances, that their effect is transitory and frequently followed by increased swelling and turgescence of the nasal mucous membrane and that they are liable to be toxic to the mucous membrane. In infants particularly, they have been held responsible in some cases for the initiation of otitis media by the washing of infected material into the eustachian tubes. Perhaps one justifiable use is in cases in which infants experience difficulty in nursing or taking the bottle because of nasal obstruction. In such cases not more than a drop of dilute 1:3,000 solution of epinephrine or a drop of 1 per cent solution of ephedrine may be placed in the nose before feedings.[1]

The practice of dropping oils of various kinds into the nose will probably lose considerable of its popularity as it becomes generally recognized that the oil may find its way to the lungs and there set up an inflammatory reaction, the so-called lipoid or oil pneumonia.[3]

Summary

The term "common cold" includes acute inflammations of any or all portions of the upper part of the respiratory tract. Treatment of the common cold may be preventive or symptomatic. The cause of the common cold may be a filtrable virus; bacteria may be coincident or secondary invaders. Isolation of infants and young children from infected individuals is of great importance. Vaccines may be given for protection with the understanding that, although they are not harmful, they may not be of benefit. Proof of the presence in food or vitamin preparations of any substance which specifically protects against colds is lacking.

Rest in bed, sedatives, humidity, baths, antipyretics and occasionally the use of epinephrine or ephedrine as nasal drops or a spray are the chief measures which may be used in symptomatic treatment.

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Discussion

Dr. Andrew Sinamark, Hibbing: This paper is an excellent exposition of the present day trends on the subject of the common cold. I agree with Dr. Kennedy's opinion that these cases are often over-treated. I believe that this is especially true as far as aqueous solutions in the nose are concerned. Nasal mucous membranes often show the effect of over-treatment with douches and sprays. An aqueous solution in an ordinary atomizer can set up small hemorrhages of the membrane.

In spite of the recent tendency to do away with oils in the nose, I still believe that oils are valuable. In spite of the fact that they have been shown to be dangerous in the case of infants, I do not feel that this is true in older children. The instillation of a nasal oil containing no more than 1 per cent menthol, an equal amount of camphor and the addition of other aromatics to make the mixture more agreeable, certainly gives the patient the sensation of better ventilation of the nasal passages. Furthermore, I believe that it actually does cause a little shrinkage. If the mixture contains a small amount of iodine (about 0.1 per cent) it causes a mild hypersecretion of the membranes which results in a depletion, which I believe is of more prolonged effect than instillation of epinephrine or ephedrine. Furthermore, there is no danger of oils initiating otitis media by washing infected material into the eustachian tubes.

EXPOSURE OF THE BODY TO UNEQUAL TEMPERATURE

A Factor in Pneumonia

CHARLES W. MORE, M.D.

Eveleth, Minnesota

In the early years of my professional life at Ely, Minnesota, I came in contact with a great many typhoid fever patients, cared for in ordinary dwelling houses, boarding houses, and shacks, heated by stoves.

It was noticed during the late fall and early winter that those patients with typhoid fever, having complications, as bronchitis or pneumonia, were occupying beds close to a window, which was the usual situation in the crowded boarding houses, the side of the bed being close to the window and the top of the bed being on a level with the bottom of the window. The heating stoves were in the room or in an adjoining hall, near the door of the room. The windows were usually closed and protected by storm windows, but the radiation from the glass produced a temperature lower on that side of the body next to it than on the side of the body toward the warm room.

The frequency with which pneumonia occurred in typhoid fever patients when thus exposed was so apparent that I had no difficulty in teaching my people its dangers, and obtaining the coöperation of the patient and his family and friends to correct the situation, which resulted in a noticeable reduction in lung complications in this disease (typhoid fever). And consequently the first question asked by the patient when I called to see him thereafter would be, "Doctor, is my bed in the right place?"

Carrying the observations further, after moving to Eveleth, it was noticed that many babies having pneumonia were those occupying a crib or baby carriage near a heating stove. On one side of the patient would be the stove and on the other a large window, or an open archway into an unheated parlor or a cold bedroom, thus exposing the patient to unequal temperature.

In a number of instances I correctly predicted that children and babies so exposed would have pneumonia. In one instance a newborn baby was left in its receptacle between a heating stove and an open archway into an unheated parlor. The parents were warned of the danger, but did not heed it. The baby died of pneumonia during the winter. When they later built another house, they sought my advice as to the proper placing of the windows and doors so that they would have ample space for the beds.

In another instance, a family having two children, aged five and eight years, moved into an apartment house. While attending the sick mother of the children, I noticed the bed for the children was next to a window, the bottom of the window being on a level with the top of the bed. The window was protected with a storm window but covered with frost. The room contained a small heating stove opposite the children's bed. The parents were informed in no uncertain terms of the danger and told positively that the children would have pneumonia if this condition were allowed to continue. The advice was not heeded and in six weeks both children had pneumonia. One died.

So emphatically was it impressed upon me that unequal temperature is an etiological factor in pneumonia that, when building my own small hospital years ago, I had the windows and doors to the rooms and wards placed opposite each other, leaving ample wall space for beds without exposing the patients to unequal temperature. Pneumonia has never developed in typhoid fever patients entering the hospital early and free from lung complications.

At one time during an epidemic of typhoid fever, the hospital ward was overcrowded and a patient, occupying a bed next to a wall twenty-two feet from a double window, was observed to be coughing. While examining the patient, I distinctly felt a draft of air on the back of my head and neck as I leaned over the patient to examine the side of his chest which was next to the wall. There was a stiff breeze coming through the top of the windows twenty-two feet away and was directed toward the ceiling by a contrivance at the top. The wind followed the ceiling and continued down the wall where the patient was. His position was, of course, immediately changed and he promptly recovered.

I have a patient who, if he leaves a warm room and walks outside while a cool breeze is blowing, will sneeze, and his nose will begin to discharge. But if he will turn around so that all parts of his chest are cooled equally, this condition soon stops.

I have observed frequently, and many practicing in the country have undoubtedly noticed the same thing, that while making what I considered to be the last call on a patient with tonsillitis, I would find the patient downstairs on a lounge next to the outside wall or window, not far from the heating stove. To the question, "How are you feeling?" the reply was, "I was feeling much better and thought I would come downstairs, but (making an effort to swallow) I don't feel as good as I did." This is another example of exposure to unequal temperature at an inopportune time, when the patient was not in a condition to stand it. Some people are more susceptible to this unequal temperature than others.

Dr. Preble says that in certain dwelling houses there seems to be a predisposition to pneumonia. It would be interesting to know the relationship of the beds to the windows and heating unit.

It is in those cases of pneumonia in children, where the parents can not or will not protect the patient from unequal temperature, that I found the pneumonia jacket, frequently changed, most useful, chiefly, I believe, on account of its maintaining equal temperature.

It will be noticed that those advocating cold fresh air for children with pneumonia, have placed them in cold rooms. Here the patient gets the benefit of the fresh air without exposure to unequal temperature.

In conclusion, I regard exposure of the body to unequal temperature to be a predisposing etiological factor in pneumonia, as well as the cause of so-called "colds in the head," coryza, tonsillitis, pharyngitis, et cetera.

AUTOGENOUS STREPTOCOCCUS VACCINES IN THE TREATMENT OF ALLERGIC CONDITIONS, WITH SPECIAL REFERENCE TO THEIR USE IN BRONCHIAL ASTHMA*

Report of Cases

R. S. YLVISAKER, M.D.

Minneapolis, Minnesota

BEFORE entering into the discussion of the subject chosen for this presentation, it would probably be well to survey briefly the field of allergy as a whole. This is done in order that the phase of the subject under consideration may be viewed in its proper perspective.

One is impressed, first of all, with the fact that the great majority of allergic cases present a family history of some form of allergy. This is becoming more and more apparent as the field has come to embrace conditions previously not considered in this light. To the old triad of asthma, hay fever, and eczema, must now be added the other forms of allergic rhinitis, sinusitis, and conjunctivitis, nasal polyps, many of the recurring wet colds, some cases of recurrent bronchitis, many cases of migraine, a large number of the vague gastrointestinal dyspepsias, possibly peptic ulcer, urticaria and the angioneurotic edemas, the spasmophilic conditions of childhood and, lastly, but assuming more and more of a prominent position, some of the chronic infectious diseases, chiefly tuberculosis and the rheumatic group. Probably other conditions should be included.

One is impressed also with the frequent association of these conditions with certain disorders of metabolism, endocrine disturbances, mineral imbalances, particularly of the calcium-phosphorus group, and with the fact that these conditions are frequently precipitated or aggravated by emotional upsets and by dietary indiscretions and deficiencies.

We are confronted, therefore, with a group of conditions which have as their point of origin a fundamentally deranged constitutional background. The distressing thing is that, in spite of the large amount of work which has been done in the field of immunity and in tissue reactions to foreign substances, very little is known regarding the real biological and physico-chemical factors involved. The present-day methods of diagnosing and treating these conditions by means of skin testing, leukopenic indices, elimination diets and the injection of various specific or non-specific proteins are all aimed at merely certain symptoms or manifestations of the fundamental constitutional disorder. In the present state of our knowledge, rather than to limit ourselves to these few procedures, it is more important that we approach these cases from every possible angle. The family history, including the health of the children, if any, must be carefully scrutinized for the particular type of background involved. The personal history should be thoroughly investigated not only for previous histories of the more obvious types of allergic manifestations but more particularly for evidence of susceptibility to acute and chronic infections, dietary idiosyncrasies and emotional conflicts. To the general physical examination and the usual blood and urine studies must be added complete examination of the stools, investigation into possible metabolic disorders, mineral imbalances especially of the calcium-phosphorus group, and endocrine disorders, as well as a complete study of the skin reactions to the various allergens.

Therapy should then be instituted for each and all of the abnormalities discovered. A word of warning should be inserted here. The error of removing too many articles of food from the diet is made more frequently than removing too few. The use of too severe elimination diets frequently leads to dietary deficiencies which in the end aggravate rather than ameliorate the patient's symptoms. It should constantly be kept in mind that all the essential food elements must be included in the diet even though it be necessary at times to do this at the expense of retaining foods to which the patient is sensitive.

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*Read in part before the Minnesota Society of Internal Medicine at its meeting held in October, 1937, Saint Paul, Minnesota.

We come then to our discussion of the use of vaccines. It is hoped that the introductory remarks have indicated that the use made of vaccines in allergy by the writer forms but one small link in the treatment of this large group of disorders. It is admitted from the outset that this study is purely a clinical one and that the series presented is too small to provide the basis for any definite conclusions. If this study will, in some small measure, add to the mass of evidence presented by others or possibly provide a new point of view for further study in certain directions, its aim will have been accomplished.

The first report of the use of vaccines in asthma which could be found in reviewing the literature, was that by Carmalt-Jones[3] in 1909. He isolated a Gram-negative bacillus from the sputum of an asthmatic, made up a vaccine and administered it subcutaneously, starting with a dose of twenty-five million organisms. A marked improvement resulted in this case. He then used the same vaccine in seventy other cases, fifty-two of which he reports. Good results were obtained in thirty-nine. The same year G. W. Davis[5] reported marked relief in a case of acute, generalized eczema following the use of a staphylococcus vaccine. In 1911 John T. Farrell[6] reported the use of autogenous vaccines in three cases of chronic, long-standing, severe, generalized eczemas, with recovery in each case. In the first case a staphylococcus albus was recovered from weeping portions of the skin; in the second a mixed culture, chiefly a large diplococcus, from a skin papule; and in the third, a colon bacillus from a grossly infected urine. Wood[19] in 1915, after having previously used staphylococcus vaccines in several cases of pustular eczema, tried autogenous streptococcus vaccines obtained from foci in the mouth, nose and throat, with good results in four cases.

From this time on, reports become more and more numerous so that only a few can be mentioned here. Chiefly some of those dealing with the use of vaccines in bronchial asthma will be reported. In 1917, Sicard[14] reported the use of autogenous streptococcus (hemolyticus and viridans) vaccines obtained from sputum cultures. He gave the vaccine subcutaneously and felt that a local reaction was necessary in order to obtain good results. Hutcheson and Budd[9] used a mixed vaccine containing usually streptococcus, staphylococcus and micrococcus catarrhalis, together with a small amount of the broth filtrate. They considered the good results to be due to the presence of an anaphylatoxin produced in vitro by the bacteria and called attention to the possibility of anaphylactic shock if the interval between injections was allowed to go over eight to ten days. Rogers,[12] in 1921, reported forty cases in which he used autogenous streptococcus vaccines, obtained from sputum cultures, subcutaneously, with only 15 per cent failures. G. Tyler Brown[2] differentiated between bacterial or non-sensitive asthma and protein-sensitive asthma. He cultured the sputum and isolated each organism present, made a vaccine from each and tested the skin intradermally with each organism, used the twenty-four hour reaction as a guide, and used only those in treatment which reacted positively. He, too, felt that a local reaction was necessary in order to obtain results. All but 10 per cent of his 144 cases were relieved or cured. Rackemann[10,11] in various articles concluded that just as good results were obtained with stock vaccines as with the autogenous, but insisted that relief from asthma came only with and was proportional to the local reaction following subcutaneous injection. Thomas and Touart[15] cultured the sputum and all possible foci, made a separate suspension of each organism isolated, and used those which gave a positive intradermal twenty-four hour reaction. They continued the injections for several weeks after relief was obtained. They also reported a case sensitive to all kinds of feathers which showed no improvement when the feathers were removed from the environment. The administration of vaccine resulted in marked improvement, which became complete when the feather pillows were again removed. Later on, the use of the pillows was not followed by recurrence.

Feinberg[7] states that in the majority of cases bacterial vaccines act in a non-specific manner, but Vaughan[17] denies this and calls attention to evidence pointing conclusively to the occurrence of a specific bacterial allergy in many cases, although he agrees that the best results from vaccines are obtained when a local reaction occurs. He uses vaccines for two purposes, namely, to desensitize and to immunize. For the former, small doses must be used; and for the latter, large doses. Voorsanger and Firestone[18] do not believe in a specific action of vaccines. They call attention to the frequent beneficial effect of stock vaccines in cases of asthma in which the onset could not be traced to an infectious process.

Bray,[1] in his book entitled "Recent Advances in Allergy," reviews in some detail the role played by bacteria in asthma. He calls attention to the work of Wilmer and Cobe (1933), who compared the incidence of bacteria in the sputa of five hundred asthmatics and two hundred controls. In asthmatics, the highest incidence was that of various types of streptococci, 67.4 per cent of all cases; while in the controls the highest incidence was shown by staphylococci (albus and aureus), 84 per cent of all cases. They further state that similar results are obtained in treatment with stock and autogenous vaccines unless only those autogenous vaccines are used which give a positive skin reaction. The latter give the best results. However, he also cites the work of Knott and his co-workers, who claimed that, in eighty-five cases out of one hundred thirty-two, the sputum was eosinophilic. Forty-two of the eighty-five showed Gram-negative bacilli in the plugs of bronchial secretion. In the remaining forty-seven cases, the sputum did not contain eosinophiles and only six of these showed Gram-negative bacilli in the plugs. Calling attention to the work of Harkavy (1929), who found a spasm-producing substance in the sputum of asthmatics during paroxysms, which was absent during the free interval, Knott and Oriel (1930) suggested the possible origin of these histamine-like substances from the Gram-negative bacilli, since culture extracts from these organisms have been known to give effects similar to those obtained from the sputum itself. Knott concluded, however, that Gram-negative bacteria can produce clinical asthma only in those people whose bronchi are already in such a state that slight further stimulation will produce bronchospasm. Acton and Dharmendra (1933) failed to confirm the histamine-like effects produced by cultures of the Gram-negative bacilli.

Many recent reports have been made of the use of vaccines in the treatment of asthma. Among these is that of Rozendaal and Maytum[13] in the United States, who used both autogenous and stock vaccines with similar results from each and concluded that the effect produced was non-specific. Vallery-Radot, Blamoutier and Nitti,[16] in France, found that the hemolytic and viridans types of streptococcus were predominating organisms in the sputum of patients suffering from asthma, as well as those having chronic bronchitis. They believe that bacterial vaccines act only in those cases with bronchitis and that the improvement in the asthma is secondary to the improvement in the bronchitis. Harley,[8] in England, subdivides asthma into four types: (1) those hypersensitive to non-bacterial substances; (2) the same plus secondary infections or toxemias; (3) bacterial asthma; (4) the same plus secondary non-bacterial sensitizations. He states that vaccine therapy is indicated in types 2, 3, and 4.

Our interest in the use of autogenous vaccines began about ten years ago in the treatment of chronic arthritis. As the allergic manifestations of this group of disorders came more and more to the foreground and as common knowledge indicated that many of the allergic group of conditions, chiefly bronchial asthma, had their onset during or following acute infectious episodes, we gradually extended our use of autogenous vaccines to include this latter group. As most of the reports which appeared incriminated the various types of streptococci as the predominant organisms in both groups, our efforts have come to be directed toward their isolation and use in autogenous vaccines. To begin with, they were used subcutaneously exclusively. Although good results were obtained, progress was often slow and indefinite. When Clawson,[4] of the University of Minnesota, reported his work on the intravenous administration of streptococcus vaccines in chronic arthritis, we gradually adopted the method in our work.

In the series of cases about to be reported, cultures were made from the sputum and any possible focus or foci of infection, including the nasal mucosa, the washings from sinus irrigations, the pharynx, the tonsils (preferably after removal), pyorrhea pockets, roots of extracted teeth showing apical abscesses, the cervix uteri, stools and directly from the rectal mucosa through the proctoscope. Plain dextrose broth and dextrose brain broth were the only media used except in an occasional case in which difficulty was experienced in obtaining the strep-

Table I

ype of Cases	Number of Cases	Intra-venous	Subcu-taneous	Complete Relief	Marked Improve-ment	Moderate Improve-ment	No Improve-ment
1. Bronchial asthma	14	12	2	4	5	2	3
2. Miscellaneous group	9	3	6	2	6	1	0
A) Allergic rhinitis	4	1	3	1	2	1	0
B) Recurrent sinusitis	1		1		1		
C) Generalized eczema	1		1		1		
D) Chronic urticaria	1		1		1		
E) Chronic conjunctivitis	1	1			1		
F) Chronic iritis	1	1		1			
Total	23	15	8	6	11	3	3

tococcus in pure culture. In such cases the mixed culture was plated out on blood agar and the pure culture obtained by subculturing individual colonies. The media had previously been titrated to a pH of 7.6. It was considered extremely important that culture media be at incubation temperature at the time the culture was taken and then transferred immediately to the incubator. It was felt that in this way pathogenic streptococci could be more easily isolated.

The bacterial sediment was separated from the supernatant broth and washed three times with normal saline. The organisms were then suspended in normal saline, subjected to heat at 60° C. for ninety minutes and the suspension tested for sterility before being used. Two drops of a 4 per cent phenol solution were added to 10 c.c. of the suspension as a preservative. A bacterial count was made in order to standardize the vaccine. This suspension was then used as a stock vaccine from which dilutions were made for administration. The undiluted vaccine was used in making skin tests, the intradermal method being used. In performing the skin test, just sufficient material to form a small bleb (usually about 0.01 cc.) was injected. If streptococci were isolated from more than one focus, skin tests were made of each, and only those used which gave positive reactions.

The initial dose of the vaccine varied from twenty-five thousand to one hundred thousand organisms. (Protein determinations have been done on a few of the vaccines. The results of these indicate that this dose contains approximately 0.00001 to 0.00004 mgm. protein.) To begin with, injections were given every three to five days. As improvement became established, the interval was lengthened to five to seven days. The interval was never allowed to go over seven days without drastically reducing the dose. The size of the dose was gradually increased until definite improvement was noted. No further increase was made as long as improvement or relief of symptoms was maintained. Any reaction following a dose called for a marked reduction in the next dose to one-fourth or one-tenth of the preceding dose. If possible, the injections were continued over a period of at least six months so as to prevent recurrences. In several cases they have been continued for periods of two to three years, with occasional rest periods of six to eight weeks.

The methods used in this study differ, then, in three main particulars from those used by others: (1) the vaccine is given intravenously in the majority of cases; (2) extremely small doses are used and a great deal of caution exercised in determining the size of each succeeding dose; and (3) long periods of continuous desensitization are employed for the purpose of preventing relapses.

Table I shows the total number of cases treated, the distribution according to diagnosis, the number treated intravenously and subcutaneously respectively, and the results of treatment. It will be noted that fourteen of the twenty-three cases were cases of bronchial asthma. In the miscellaneous group, the cases of recurrent sinusitis, chronic conjunctivitis and chronic iritis were included because they presented definite evidence of sensitization to bacterial proteins. The vaccine was administered intravenously in fifteen cases, subcutaneously in eight cases. In reviewing the results of treatment, it is seen that seventeen of the twenty-three cases obtained complete relief or nearly so. There were three failures, all cases of bronchial asthma. Further reference to these results will be made later.

In Table II the number of cases giving a history of onset associated with or following an acute infectious process is shown. These cases are designated, for convenience, the infectious cases. Eighteen of the twenty-three cases had such an onset. This Table also indicates the number of cases with a personal history of other manifestations of allergy and those with a family history of allergy. These figures were obtained from routine histories. It is felt that the number of positive histories would very likely have been increased if more detailed histories had been obtained. It shows, however, a similar distribution of positive histories in the infectious group as in the entire series. This Table also shows the number of cases with positive intradermal tests to proteins other than bacterial. These were carried out in eighteen cases of the series. Each case was tested with a large number of substances, especially foods. All cases gave a certain number of positive reactions. A subdivision was, therefore, arbitrarily made into those with few reactions (less than ten), and those with many. Again, a similar distribution is seen in the infectious cases as in the entire series. This Table finally reveals that sixteen of the eighteen cases tested intradermally with their own vaccine showed an immediate positive reaction of the protein sensitization type.

The result of studies shown in Table II is in direct contradiction to the statements made in many of the previous reports, namely, that the bacterial or infectious types of cases belong to a separate insensitive group in which family histories of allergy and positive skin reactions of the immediate protein sensitization type are rare.

TABLE II

	Asthma	Misc.	Total
Total cases	14	9	23
Infectious cases	12	6	18
Personal history of other manifestations of allergy:			
Total	7	5	12
Infectious	6	3	9
Family history of allergy:			
Total	6	3	9
Infectious	6	2	8
Cases with positive skin reactions to other proteins:			
Total—few	4	0	4
many	8	6	14
Infectious—few	3	0	3
many	6	4	10
Skin reaction to vaccine:			
Total number done	11	7	18
Immediate reaction	10	6	16

Very little difference in the end-results was noted between those given vaccine subcutaneously and those given it intravenously. The definite clinical impression was gained, however, that more prompt and precise improvement was obtained in most of the cases receiving the vaccine intravenously.

In two cases in which the administration of the vaccine was begun intravenously, it became necessary later to change to the subcutaneous route of administration because of severe reactions. In one of these, the reactions appeared soon after treatment was started even though minute doses were given. Soon after the subcutaneous method was begun, a slow but steady improvement resulted which finally led to complete relief. In the other case, intravenous administration was originally followed by prompt and almost complete relief of symptoms. This continued for about two months, when reactions to each dose began to appear until almost constant asthma was again present in spite of drastic reduction of dosage. The subcutaneous method was then substituted and recently gradual improvement has again definitely become apparent.

Two of the three failures can possibly be explained on the basis of incomplete management. In one case, after showing considerable improvement, the patient discontinued taking the vaccine. After a few weeks he developed a severe recurrence and died suddenly during a period of almost constant asthma. Examination previously had shown evidence of myocardial disease, but it was definitely felt that he was suffering from a true bronchial asthma rather than a cardiac asthma. The second case was that of a man, 44 years old, somewhat below par in intelligence. He had had asthma for fifteen years, the onset following an acute respiratory infection. He was sensitive to many foods and pollens, in addition to bacteria. It was almost impossible to obtain proper coöperation in carrying out his dietary management and this, no doubt, accounted at least partially for our failure. Another case of severe asthma, not included in this series because of insufficient treatment, had been given four or five intravenous doses of an autogenous vaccine at 5-day intervals. The administration of the next dose was then unavoidably delayed until the 8th day. Although the dose was the same as that previously given, it was followed by a severe exacerbation of her asthma within a few hours. Further treatment was refused.

Good results in this series can be illustrated by the following cases.

A girl, aged fourteen, had developed a severe asthma following a bronchopneumonia four years previously. Her mother and one aunt had had asthma and there was hay fever in her father's family. She had suffered previously from frequent head colds. Before coming to us, she had been studied carefully by another physician. She had been found sensitive to many foods by skin tests, but dietary management on this basis had produced no results. We felt that eliminating all the foods to which she was sensitive involved the danger of dietary deficiency, so she was placed on a well-balanced diet with high vitamin content and limited in carbohydrates, without regard to the skin tests. She was given calcium salts by mouth. This management produced very little change in her asthma, but, almost immediately after small doses of vaccine were started intravenously, a marked improvement occurred. This has been maintained for a year and she has been able to return to school.

Good results have not been confined to those cases with a history of onset following acute infections.

A physician, aged thirty-one, first came to Minnesota in January, 1936. He had previously never had seasonal hay fever although he had been subject to frequent head colds. In August, 1936, he was taken with a typical severe hay fever which persisted through the ragweed season. Instead of being relieved when frost came, however, the severe allergic type of rhinitis persisted through the fall and winter. He was found to be markedly skin-sensitive to many foods and pollens, including ragweed. A streptococcus was isolated from his nasal secretions. The intravenous administration of this vaccine was promptly followed by marked relief of his symptoms. This year he has been successfully carried through the ragweed season on a combination of his vaccine intravenously and pollen extracts subcutaneously.

In conclusion, then, we would like to suggest the following points for further study:

1. The so-called bacterial or infectious types of allergy, especially asthma, are fundamentally similar to other forms of allergy.
2. The beneficial effect produced by minute doses, both subcutaneously and intravenously, are probably due, not to a foreign protein shock therapy, but rather to a specific type of desensitization.
3. The intravenous route of administration produces more prompt and precise results than the subcutaneous. Severe reactions may be expected following intravenous administration if too large doses are used or too long an interval is allowed to elapse between doses.
4. The beneficial effects of vaccines in allergic states, especially asthma, are not confined to the primary bacterial allergies but may also be of value in certain cases in which the bacterial allergy is secondary.

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ACUTE MASTOIDITIS*

J. G. PARSONS, M.D.

Crookston, Minnesota

In treating the subject which has been assigned to me, it is obvious that only the high spots can be touched within the limits of the time which is available. I have therefore thought best to emphasize some of the most important points, as they concern the general practitioner, and make some comment on certain faulty conceptions which are quite commonly observed by otologists.

The most commonly met picture of acute mastoiditis is that of a post-aural pain, tenderness and swelling following a discharge from the ear which has continued for some time and has lessened prior to the occurrence of these symptoms. These symptoms indicate an involvement of the mastoid cells, with more or less bony necrosis, and are supposed to be due to an extension of middle ear suppuration because of pressure resulting from poor drainage from an opening in the drum head.

The chief considerations are the relief of pain and the prevention of intracranial complications which may occur as the result of extension of the infection inward instead of outward. Surgical treatment consists in opening the mastoid bone, curetting out softened bone and keeping the wound open by gauze dressings until it has healed by granulation—a process requiring a varying length of time, and usually evidenced by a good sized depressed scar and quite probably serious damage to hearing.

Adhering too closely to this general idea of acute mastoiditis often results in some fallacious reasoning as to pathology, diagnosis and treatment.

While the most common avenue of infection of the middle ear is through the eustachian tube, by continuity of tissue from an infected naso-pharynx, the infection being forced through a patent tube by blowing the nose, coughing, sneezing and vomiting, it should be borne in mind that this infection may be carried through blood and lymph channels.

The type of infection is a matter of considerable importance. Frequent studies of smears from a discharging ear give important information as to the pathological probabilities which are present. Streptococci, especially the mucosus capsulatus, are liable to be very destructive to bone. Predominance of staphylococci points to a long drawn out infection.

Infection of the middle ear practically always means a coincident infection of the mastoid antrum, where germs of a more virulent type, especially if there is not free drainage, find an easy entrance to adjacent mastoid cells. There is a certain analogy between the bony cavities of the temporal bone which are connected with the mucosa of the naso-pharynx and those of the nasal accessory sinuses. Most acute infections of the sinuses clear up spontaneously if there is good drainage. So also do infections of the middle ear, many of which drain through the eustachian tube. If the eustachian tube is swollen and does not permit free drainage it is the pressure on the drum as well as the inflamed mucosa which causes pain, especially in the presence of a virulent infection.

It is highly probable that most cases of acute mastoiditis were coexistent with a middle ear infection from the start, and that many of them clear up if given a chance to drain adequately. Adequate drainage of the middle ear when there is a bulging drum head or if there has been a spontaneous rupture with pus in the external meatus must be borne in mind as an essential in heading off mastoiditis. I use the words

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"heading off" advisedly, for it implies not only the prevention of mastoid infection, but the checking of a beginning infection as well.

One of the fallacies too frequently met is the notion that as long as an ear is draining there is no cause for concern. It is essential to actually see the drum head and note the size of the perforation. If it is not freely open it should be enlarged, repeatedly if need be, to provide a safety valve of adequate drainage.

If there is post-aural pain, even if there is no discharge, the mastoid should be carefully investigated, for there is sometimes involvement of the mastoid without aural discharge. Pressure over the antrum opening of the mastoid emissary vein or over the mastoid tip will be painful in most cases although if the bony cortex is very thick this tenderness may be slight.

Edema will be noted in many instances when the cortex of the mastoid process is thin, as in infants, but does not necessarily indicate the need for operation. However, a distinct post-aural swelling, especially if the ear is displaced, is very suggestive of mastoiditis. Care should be taken to exclude a boil in the external canal which may produce both edema and tenderness similar to mastoiditis. If the tenderness is more marked when pressure is directed toward the external meatus instead of away from it, furunculosis should be suspected. A swelling of the posterior superior wall of the external canal adjacent to the drum head is significant of involvement of the mastoid antrum, which lies immediately within.

The presence of post-aural pain, tenderness and swelling of the external canal, often called the "dip," usually a diagnosis of probable mastoiditis. Temperature and pulse changes give further information, but there may be a well developed mastoiditis without much disturbance of temperature or pulse. A steady high temperature suggests a blood infection or meningitis, while a sudden high temperature, followed by a drop and chill, point toward thrombosis of the lateral sinus, which lies in immediate relation with the cells of the mastoid.

The blood picture is of value as in infections elsewhere. Persistence of a high polymorphonuclear percentage is an indication for operation.

Swelling below the mastoid tip is sometimes mistaken for a neck abscess not associated with ear infection. This is not infrequently due to an extension of infection from one of the larger mastoid cells found in the tip, the so called Bezold's mastoiditis. Likewise the cells which are found in the root of the zygoma may be involved and swelling there may throw one off the track of diagnosis if he is looking for all the classical symptoms, including post-aural swelling.

It is well to observe here that infection of the mastoid bone may jump across a sound area, through vascular channels, and be overlooked at the time of operation, unless one makes it a point to make a complete exenteration of the mastoid cells, a standard procedure in operating. Any discharging ear is dangerous. Heath of London used to refer to the mastoid as "the aural appendix." It is wise to have the same respect for this appendix as for the one found in the abdominal cavity.

An ear which has been discharging for more than a week without diminution should be held under suspicion. The drainage must be kept free, and the character of the infection watched, especially if streptococci are found. Prolonged discharge points to involvement of an area larger than the tympanum. It means also damage to hearing in proportion to the duration of the discharge. While one may not be arbitrary about the matter, it is a wise rule to conclude that a persistent ear discharge lasting three weeks means mastoid infection, and quite probably the need for operation.

It is true that Nature is wonderful but I believe it is wiser to err on the side of early operation, save a few more lives and many more hearing ears, than to be too conservative, which attitude is popular at present.

It is true that a reasonable delay in operating allows time for walling off of the infected area, but this calls for the exercise of sound surgical judgment, which with the experienced otologist becomes almost intuitive. It is also true that properly taken and properly interpreted x-ray films are valuable, but can not replace accurate clinical observation.

Time will not permit more than a passing reference to mastoidectomy, and post-operative care. However, it should be emphasized that mastoid surgery calls for a degree of technical skill, not only in determining when but how to operate on an individual case. The post-operative care is also important.

For many years I have used the blood clot method, and have seen about 60 per cent of my cases heal with primary union, with less damage to hearing and with much better cosmetic results than is obtained by open methods. The method calls for care in completely removing all infected and devitalized tissue, the avoidance of antiseptics in the wound, careful asepsis, and subcutaneous closure, preferably with copper wire.

Post-operative care calls for frequent change of ear drains, making sure there is a free incision of the drum head at operation. The procedure amounts to practically converting a mastoiditis into a simple otitis media. If the wound should break down it is a simple matter to spread the lower angle enough to insert a strip of rubber tissue, which I have found to be all the drainage required in any mastoid wound. The use of gauze packs is painful to the patient and damaging to regenerating tissue. The wire sutures are easily removed with a single pull in about a week. A collodion cocoon in cases which have a slight oozing is fully as satisfactory, and much less unsightly than a head bandage.

The question sometimes arises as to the advisability of sending patients home for post-operative dressings. I believe this is inadvisable, for the technic of making mastoid dressings calls for almost as much skill and judgment as operation. Further it is important to observe the progress of the middle ear closely in order that the return of normal function may be given every chance.

It should be borne in mind as stated before that we are concerned not only with saving life but with the conservation of hearing.

Discussion

Dr. Walter E. Camp, *Minneapolis:* The usual features of acute mastoiditis are well understood by both general practitioners and otologists. Dr. Parsons has very forcibly emphasized some of the unusual features in both surgical and non-surgical mastoiditis. The diagnosis of surgical mastoiditis in most cases is not difficult; not infrequently, however, cases are encountered which are very misleading.

In all cases of acute suppurative otitis media the mucosa of the mastoid antrum and mastoid cells is involved to a variable degree. The amount of involvement of the mastoid, the severity of symptoms, the question of surgical intervention, and liability or frequency of serious complications are features which are determined by such factors as: (1) type and virulency of the invading organism; (2) speed and adequacy of drainage of the middle ear; (3) the anatomical type of mastoid involved; (4) immunilogical and therapeutic response of the individual affected.

In some cases, acute mastoiditis, even with some bony cell destruction, will heal without surgical interference. This occurs most often in cases where the invading organisms are not exceedingly virulent and the cells surrounding the mastoid antrum are large enough not to be blocked by edema and granulations.

Early and adequate drainage of the middle ear as emphasized by Dr. Parsons is exceedingly important to prevent surgical mastoiditis. Acute mastoiditis, due to hemolytic streptococcus, will, in some cases, respond early to sulphanilamide.

In this usual routine of office and clinical work one should always be alert for the unusual or atypical type of mastoiditis with a minimum of clinical symptoms and signs. During the past five years it has been my privilege to see five of these unusual cases. Three of them were cases of frank otitis media in which early and adequate drainage was secured. The patients were symptom-free except for pain and slight aural drainage. There was no fever, no tenderness of the mastoid, no prolapse of the posterior canal-wall, no leukocytosis. Roentgenograms in these cases showed only slight cell destruction. All three cases developed meningitis, two from direct extension through the petrous pyramid and one through vascular channels. The other two cases were of the so-called latent or "silent" mastoiditis. The ear drums were normal. There was no perforation or history of aural discharge. Both these patients developed lateral sinus thrombosis and bacteremia, and both survived following the required operation.

These unusual cases should keep one always alert and should emphasize the clinical importance of routine and, if necessary, repeated x-rays. They should also emphasize the clinical importance of one very urgent symptom—namely, pain. Persistent mastoid pain or headache, even in the absence of any other clinical sign, except possibly positive x-ray, should be sufficient evidence to justify exploration of a questionable mastoid.

The optimum time for surgery in acute mastoiditis is after a variable amount of necrosis has developed and opportunity given for the development of some degree of local tissue immunity—an interval of from ten to fifteen days in the usual case. In some severe infections, however, especially those complicating scarlet fever and pneumonia, a "malignant" type of mastoiditis can develop within four or five days and demand early operation.

THE PROBLEM OF GASTRODUODENAL HEMORRHAGE*

ALBERT M. SNELL, M.D.

Rochester, Minnesota

ALTHOUGH it is true that bleeding from peptic ulcer may occur without serious consequences in many instances, there are few more urgent clinical situations than those presented by massive gastroduodenal hemorrhage and few that on occasion may make such heavy demands on the courage, judgment, and decision of the physician. The problems of diagnosis and prognosis hinge upon a decision as to the source of bleeding, the type of vessel involved and the rate at which blood is being lost; the problems pertaining to treatment are concerned with meeting the immediate emergency caused by the hemorrhage, the prevention of further bleeding, and later, the matter of dealing with the hemorrhagic lesion itself. The present discussion will be concerned chiefly with brief considerations of the foregoing points with special reference to current views on the problems of treatment.

Statistical Considerations of the Sources of Hemorrhage

The sources of bleeding, as determined from a series of 688 consecutive cases of hematemesis taken from the files of The Mayo Clinic, have been recently tabulated by Rivers and Wilbur.[31] It was found that in about 90 per cent of cases the bleeding came from demonstrable intrinsic lesions in the stomach or duodenum; that in about 5 per cent of cases diseases of the liver or spleen were responsible, hemorrhage ensuing from ruptured esophageal varices; and that in the remaining 5 per cent of cases the source of bleeding was ascribed either to miscellaneous or unverified causes. This miscellaneous group included rare instances of bleeding due to such uncommon causes as blood dyscrasias and hemorrhagic cholecystitis; in this group it was not possible to exclude erosive lesions of the gastroduodenal mucosa.

Since most of the hepatosplenic lesions present a fairly definite clinical picture and constitute an entirely different problem in treatment, the discussion to follow is concerned only with the 95 per cent of cases in which lesions of the stomach or duodenum were known to be present or in which the source of the blood lost was not definitely demonstrable.

By far the commonest cause for diffuse gastro-intestinal bleeding in the 90 per cent of cases in which it is due to an intrinsic gastroduodenal lesion appears to be duodenal ulcer; it accounted for the bleeding in 57 per cent of the cases in the series just mentioned. Secondary anastomotic or recurrent peptic ulcer was the source of hemorrhage in 14 per cent of the cases, and gastric carcinoma ranked third, making up 12 per cent of the group. Gastric ulcer was responsible for hemorrhage in 6 per cent of cases. Miscellaneous lesions of the stomach, including benign tumors and polyps, were the least common cause, comprising only 1 per cent of the total. Allen's figures on the causes of massive gastroduodenal hemorrhage in 231 cases showed a somewhat different distribution of lesions, the incidence being as follows: duodenal ulcer 41 per cent, carcinoma 20 per cent, gastric ulcer 18 per cent, gastrojejunal ulcer 3 per cent, and miscellaneous or unverified lesions 2 per cent; in the remaining 16 per cent of cases the bleeding came from esophageal varices. Since gastric cancer usually produces cachexia before severe bleeding occurs and since benign tumors are decidedly rare, these causes may be further eliminated from discussion at this point and attention centered on bleeding peptic ulcer.

Bleeding Peptic Ulcers

How many ulcers bleed? Figures from different parts of the world vary considerably, but it is quite generally agreed that from 12 to 20 per cent of peptic ulcers bleed at one time or another. This percentage does not, of course, include the much larger group in which the loss of blood is microscopic and relatively unimportant. In addition to the "certified" cases of bleeding ulcer there is a fairly large group included in most series of cases with gastroduodenal bleeding in which the presence of peptic ulcer has been suspected but not conclusively proved. Since the advent of gastroscopy it has been possible to segregate a considerable number of patients who bleed because of ulcerative gastritis with mucosal erosions; as a group these patients may be said to have authentic histories of ulcer and negative roentgenologic findings. During the past year a number of patients coming under this classification have been subjected to gastroscopic examination at the clinic and have been found to have erosive lesions of the stomach of such size and character as to account for the hemorrhage. It is now reasonably certain that many patients to whom the diagnostic terms "gastrostaxis" or "gastrorrhagia" have been applied are in reality the victims of hemorrhagic gastritis. Alcohol appears to figure largely in the production of this type of gastritis, as Benedict's observations show, although it is certainly not the sole cause.

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*From the Division of Medicine, The Mayo Clinic, Rochester, Minnesota. Read before the meeting of the Minnesota State Medical Association, Duluth, Minnesota, June 30, 1938.

The pathologic changes in an ulcer which lead to hemorrhage have been discussed many times and need be considered only briefly here. Many small lesions must bleed freely at the time of their formation, as is doubtless the case with the hemorrhagic erosions found in gastritis. There is good experimental evidence to substantiate this opinion, as shown by the studies of Stalker, Bollman and Mann[35] on the formation of ulcers produced by the administration of cinchophen. Other lesions apparently bleed during the stage of healing when the bud of granulation tissue that forms at the base of an ulcer becomes injured or dislodged (Caylor).[11,12] Massive or fatal hemorrhage is most often due to erosion of an artery, usually a branch of the pancreaticoduodenal artery, lying in the base of an ulcer; this is obviously due to extension of ulceration through the submucous and muscular coats of the stomach or duodenum, a condition which is most frequently found in very active inflammatory and penetrating ulcers.

Factors Provoking Hemorrhage

A great many gastroduodenal hemorrhages appear out of a clear sky when the patient is having no symptoms of ulcer at the time; no good explanation can be offered as to why bleeding begins under such circumstances. In other cases some definite cause can often be found, of which perhaps the commonest is unaccustomed physical exertion. For instance, it is not uncommon for a patient to bleed following heavy work, lifting, violent exercise, or a long period at the wheel of an automobile; this is most often noted if the individual in question has been living a sedentary life and suddenly engages in vigorous physical activity. The abuse of alcohol is another common exciting factor, bleeding being particularly likely to occur after an episode of heavy drinking. Rivers[29] has emphasized the importance of focal and intercurrent infections in producing hemorrhagic gastroduodenitis, while Crohn and Shwartzman[16] have invoked the Shwartzman phenomenon as an explanation for the reactivation of a hemorrhagic ulcer following respiratory and other infections. In other words, there is reason to believe that certain infectious processes may produce either fresh hemorrhagic lesions or cause bleeding in a chronic ulcer.

A fourth factor relating to the cause of hemorrhage, which has only recently been considered, has to do with the possible influence of vitamin deficiency. Most patients with peptic ulcer subsist on diets which may be somewhat limited, especially in respect to fresh foods and vegetables, and there are many patients who voluntarily make even more drastic reductions in their intake of food. Many avoid citrous fruits, either because of the discomfort produced or because they feel that such fruits are "too acid" for their stomachs. Rivers and Carlson[30] have noted low levels of cevitamic acid in the blood and urine of certain individuals with hemorrhagic peptic ulcer and have also demonstrated an increase in capillary fragility in some such cases. Do these patients suffer from a latent or subclinical form of scurvy? Curiously enough, the older literature makes little reference to severe gastro-intestinal bleeding in advanced or proved scurvy except in the terminal stages of the disease. But, there are nevertheless certain well authenticated cases of gastro-intestinal bleeding which resulted from an established vitamin C deficiency, acting independently or through the medium of a peptic ulcer. Attempts have been made to determine the degree of unsaturation of the organism with cevitamic acid by the administration of large single doses and determinations of the amounts eliminated in the urine during the next few hours (Lazarus).[20] The limits of normal for this procedure have not as yet been clearly established and, consequently, figures based on this evidence cannot be taken at face value. Vitamin P, a flavone glucoside closely related to cevitamic acid, may enter into the picture since it seems to be concerned with the maintenance of normal capillary permeability and possibly with the absorption of cevitamic acid. The fat soluble, antihemorrhagic vitamin K may also be deficient in the diet of some individuals; we have recently noted one patient with recurring gastroduodenal hemorrhage who had been on a limited diet and whose prothrombin clotting time was found to be markedly prolonged. In this case the administration of vitamin K corrected the apparent prothrombin deficiency and possibly aided in the control of the bleeding.

This antihemorrhagic vitamin K is found in close association with another substance which may be of even greater importance in the genesis of bleeding from an ulcer; this is the gizzard-erosion factor, first noted by Almquist and Stokstad,[3,4] which is responsible for hemorrhagic erosion of the gizzard of chicks fed on deficient diets. Cheney[13] has recently directed attention toward the possible significance of this factor in the production of gastroduodenal hemorrhage. Much more information is required in respect to the distribution of the various vitamins in the diet of patients with ulcer and the rates of absorption under normal and pathologic conditions before a final statement on the matter can be made. It does seem, however, that vitamin deficiency may be of particular importance in the rather large group of cases of hemorrhage of indeterminate origin when a gastro-intestinal lesion adequate to explain the bleeding cannot be demonstrated. Also, the possible importance of vitamin deficiency may logically be advanced as an argument in favor of early and liberal resumption of a normal diet following hemorrhage.

The Clinical Course and Complications in Cases of Moderately Severe Gastro-Intestinal Hemorrhage.

It is well known that many bleeding ulcers are of the so-called silent type in that they produce few of the usual dyspeptic symptoms at any time. In such cases hemorrhage often appears suddenly and without warning. In older patients there may be definite prodromal symptoms of increasing ulcer dyspepsia, sometimes characterized by clinical evidence of penetration. In a minority of cases there may be minor dyspeptic symptoms accompanied by melena, with a gradual falling off of the blood count for several days before actual gross hematemesis appears.

The symptoms of massive bleeding are too well known to require elaborate description; they consist as a rule of melena, hematemesis, profuse sweating, and subsequent collapse, but not necessarily occurring in this order. The systemic evidence of hemorrhage may precede the actual appearance of blood in the stools and vomitus. Examination of the patient, seen immediately following or during an active hemorrhage, reveals little but pallor, tachycardia and hypotension, and a small pulse pressure. The rapid "thready" pulse of hemorrhage is the common expression of this last-named phenomenon. Other patients are admitted to the hospital in a condition suggesting shock. Blood counts taken on admission are extremely variable, depending on the rate of bleeding, the amount of blood lost and the previous level of hemoglobin. There may be evidence of hemoconcentration in the first specimens of blood examined, presumably because of the large amount of fluid lost with the shed blood and as a result of sweating. Therefore, the true magnitude of the hemorrhage may not be appreciated until adjustments in the body fluids have had time to occur and the normal plasma content of the blood is restored. This may explain the fact that the blood counts tend to fall even after the actual hemorrhage has ceased. In sixteen cases observed by Noth and Wilbur,[26] the average concentration of hemoglobin taken at its lowest point was 6.5 gm. per 100 c.c. and the number of erythrocytes 2,250,000 per cubic millimeter of blood; the extremes of hemoglobin variation were 3.2 and 12.9 gm., respectively, and those for the erythrocyte counts 1,200,000 and 4,800,000.

The chemical constituents of the blood often show very marked changes, consisting of a fall in plasma proteins and a marked elevation in blood urea and nonprotein nitrogen. The fall in circulating protein is comparable to that produced by plasmapheresis, although the nature of the last-mentioned condition, the so-called extrarenal azotemia, is not well understood. It has been variously attributed to dehydration, to the effects of protein destruction in the body, to a temporary falling off in renal function produced by a falling blood pressure and a reduced rate of glomerular filtration (Alsted[5,6] and Meyler[23]), and even to an actual degeneration of the epithelium of the kidney produced by anemia. Resorption of the blood from the intestinal tract appears to play a definite part in the process, as has been shown by the fact that patients who vomit most of the blood or whose stomachs have been aspirated have a less striking rise in urea than those who retain blood in the intestinal tract. Slight fever is often noted during the period when the intestinal tract is full of blood; the reasons for this are as yet unknown.

For how long a period does active bleeding persist? There is good reason to believe that in many nonfatal cases there is only one large hemorrhage. The stools, however, may show blood for several days thereafter because of the length of time required for the intestinal tract to empty itself. It is estimated that some eight to twelve days are required before the stools are negative to the benzidine test after a single hemorrhage, which incidentally, appears to be about the time required for a single dose of barium sulfate to be completely eliminated from the intestinal tract. In fatal cases, continuous or recurrent bleeding is the rule and blood may be lost with great rapidity. In other cases it may be possible to detect two or more episodes of hemorrhage a few days apart, and in still other cases, there may be evidence to show that continuous, slow bleeding is taking place.

In the case of an otherwise healthy individual regeneration of blood takes place rapidly after gastroduodenal hemorrhage. Schiødt[33] has noted that the erythrocyte count reaches a level of about 4,500,000 per cubic millimeter thirty-three days after the lowest level has been recorded, this peak being attained at about the same time regardless of the level to which the count fell. Curiously enough, he found little or no evidence to indicate that transfusion increased the rate of regeneration after hemorrhage.

The Mortality Rate of Gastroduodenal Hemorrhage From Ulcer

It is believed that in from 25 to 30 per cent of of all fatal cases of peptic ulcer death is due to hemorrhage (Monroe and Emery[24]). Figures for the mortality rate of individual gastroduodenal hemorrhages arising from peptic ulcer, however, cover the widest possible range and are, for this reason alone, extremely difficult to interpret. Babey's[7] figures are a case in point; he cited mortality figures ranging from 1 to 25 per cent in various hospitals in Europe, Great Britain, and the United States. The most probable explanation for these wide variations is that in some hospitals only patients with the more serious degrees of bleeding are admitted whereas, in others, all patients who show any signs whatever of loss of blood are taken into the hospital for observation. In order to get any accurate figures for mortality it would, therefore, be necessary to classify hemorrhages on the basis of their severity, a problem which Allen[2] and Benedict[9] have attempted to clarify.

Even with due allowance for this factor there are some sectional variations in the mortality rate from hemorrhage which are not easily explained. These sectional differences, if taken at their face value, seem to indicate that a hemorrhagic ulcer in some sections of the world is a distinctly more fatal lesion than in others. At Guy's Hospital in London only twenty-five deaths from gastroduodenal hemorrhage occurred in twenty years (Hurst and Ryle[19]), whereas the mortality rate from hemorrhage in the Scandinavian countries seems to range from 10 to 15 per cent. At King's County Hospital in Seattle, Blackford and co-workers[10] noted that the nortality rate from hemorrhage was about 20 per cent and Leon Schiff[32] has noted a 14 per cent mortality rate at the Cincinnati General Hospital. Goldman's[17] mortality figures (San Francisco) are also high (11 per cent).

The mortality rate in Minnesota hospitals and clinics seems to be definitely lower. The fatalities which we have had at the clinic are not a reliable guide since many patients with severe bleeding could hardly have been brought from any distance and the local population is too small to provide any large number of serious cases. The mortality rate at the clinic for individual hemorrhages, however, is well under 5 per cent. Regnier,[28] of the Minneapolis General Hospital's surgical staff, has kindly supplied me with figures which indicate that the mortality rate in that institution is less than 3 per cent; Noble[25] of the Ancker Hospital (Saint Paul) expresses the belief that the mortality rate at that institution was approximately 2.5 per cent. No satisfactory figures are available for Saint Mary's Hospital at Duluth or for the University Hospital (Minneapolis) but in the opinion of the consultants in these hospitals the mortality rate from hemorrhage from peptic ulcer is less than 3 per cent, which is about the estimated mortality rate on the hospital services in Rochester.

Fatal Gastroduodenal Hemorrhage.—In which locations in the body are ulcers most likely to produce fatal bleeding? There is some evidence, hardly to be considered final, to show that hemorrhage from a gastric ulcer is more likely to result fatally than one which occurs from a duodenal ulcer. Scott,[34] in reviewing thirty-nine cases of fatal hemorrhage, found that in twenty-three the bleeding occurred from duodenal ulcer, in sixteen from gastric ulcers; this is of course not in agreement with the usual ratio of ten duodenal ulcers for each gastric ulcer. Portis and Jaffe's[27] figures, taken from necropsy data, show an even greater discrepancy, twenty-two gastric ulcers and fifteen duodenal ulcers being productive of fatal bleeding. Allen's[1] figures, on the other hand, show a less striking percentage difference in mortality rate; he cited thirteen deaths in a series of ninety-four cases of hemorrhagic duodenal ulcer and six in a series of forty-two cases of bleeding gastric ulcer. Even on the basis of his figures it would appear that serious bleeding occurs more often from gastric lesions than from those located in the duodenum.

All figures on the mortality rate of hemorrhagic ulcer, in whatever location, indicate that the most serious and uncontrollable types of bleeding occur in older individuals. Goldman[17] noted that 70 per cent of all hemorrhages, fatal or nonfatal, occurred in patients past the age of forty years and that there was a definite rise in the mortality rate with advancing age and with each repeated hemorrhage. Allen's[1] figures indicate that the mortality rate from massive hemorrhage in patients past fifty, admitted to the Massachusetts General Hospital, is approximately 33 per cent.

In another paper Allen and Benedict[2] have noted that the average age at which fatal hemorrhage occurs is about fifty-six years. In short, all of the available figures indicate that fatal bleeding is relatively less likely to occur in individuals under the age of forty and is much more common in individuals over fifty. A surprising number of initial hemorrhages are fatal in these older individuals, the usual course being that of rapidly repeated episodes of massive bleeding. These repeated hemorrhages often occur within a short space of time, usually within a period of about seventy-two hours. According to Gordon-Taylor,[18] the first three days of massive bleeding will account for about 40 per cent of the deaths, 25 per cent of which will occur on the third day alone. If there is further loss of blood after the third day the mortality rate, in this author's experience, rises to 78 per cent. This is, in general, about our experience with fatal hemorrhages at the clinic. Table 1 gives the significant data in seven cases of fatal hemorrhagic ulcer recently observed at the clinic; it shows the nature and source of bleeding better than could be done by a lengthy discussion. It may be agreed, therefore, that the most severe grades of hemorrhage from gastric or duodenal lesions occur in older individuals, usually males, following a period of active symptoms of ulcer, and that the commonest pathologic finding is an active inflammatory ulcer, with erosion of an artery, often a sclerotic one, at the base (Fig. 1).

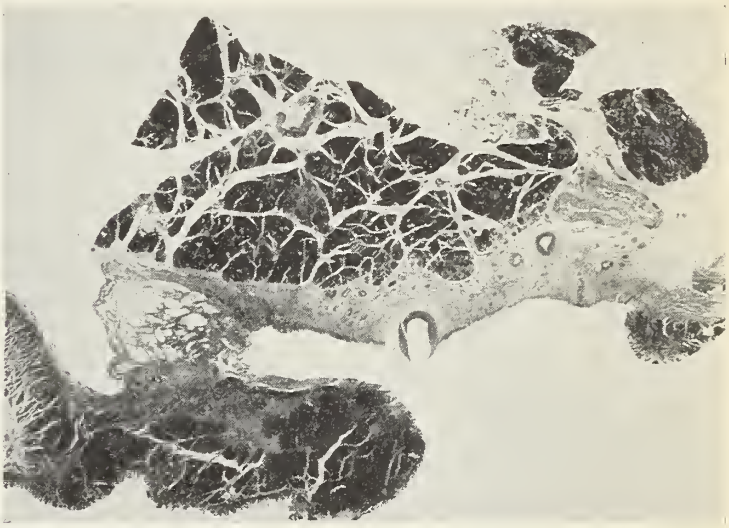
Fig. 1. Erosion of a branch of the pancreaticoduodenal artery in the base of a duodenal ulcer, with fatal hemorrhage (x2½).

Treatment of Acute Hemorrhage

On the basis of the statistics and mortality figures just cited, it is apparent that individualization of the treatment of gastroduodenal hemorrhage is essential and that routine methods of management cannot be outlined for all cases. Minor degrees of bleeding require little in the way of special therapy, rest in bed and a moderate reduction in diet being as a rule sufficient. Profuse hemorrhages raise the additional problems of maintaining blood volume and renal

TABLE I. FATAL HEMORRHAGIC ULCER

Age, years, and sex	First records after admission				Duration of ulcer symptoms, years	Previous operations	Previous hemorrhages	Source of bleeding	Remarks
	Blood pressure, mm. of mercury	Hemoglobin, gm. per 100 c.c.	Red cells, millions per cubic millimeter	Urea, milligrams per 100 c.c.					
34 M	90/60	No record	No record	No record	11	Gastro-enterostomy ten years previously; disconnected 1937.	4	Hemorrhagic gastrojejunitis.	No chronic ulcer found.
34 M	84/50	8.9	2.25	96	2	None	0	Gastric ulcer (5x3 cm.) with open vessel at base.	Persistent bleeding for one week.
55 M	60/?	10.2	3.73	28	18	None	1	Hemorrhagic inflammatory duodenal ulcer (2x1.5 cm.). No open vessels.	Bled persistently one week. Pyloric obstruction on admission.
58 M	70/40	6.2	2.52	58	15	Gastro-enterostomy 1931 and excision of gastrojejunal ulcer 1934. Partial gastrectomy 1937.	0	Ulcer in duodenal stump with erosion of large artery.	Typical ulcer formed with very active inflammatory ulcers. Died fourth day after bleeding began.
62 F	96/60	6.0	2.22		13	None	0	Duodenal ulcer (1.8x2.7 cm.) with open artery at base.	Survived twenty-two days after bleeding began.
60 M	94/40	5.7	3.48	60	15	None	3	Large duodenal ulcer with open artery at base.	Survived fourteen days after bleeding began.
68 M	86/70	17.0	5.0	102	20	None	0	Large (6x10 cm.) serpiginous ulcer in stomach. Perforating duodenal ulcer (1.5x1 cm.) with open artery.	Renal insufficiency and gangrene both legs. Lived ten days after bleeding began.

function, while massive or arterial hemorrhage can hardly be controlled except by a direct surgical attack. Unfortunately, one cannot at the onset of hemorrhage predict with any certainty the degree of bleeding which may eventually be attained. The best plan is to be prepared for serious loss of blood. For this reason each hospital should establish a definite organization and a general plan of management for cases of hemorrhage since such standardization of the methods of approach may result in the saving of lives. The necessity for routine orders covering such matters as the frequent recording of blood pressure, pulse and blood counts is apparent and a blood grouping and estimation of blood urea should be carried out without delay. Apparatus for the administration of fluids subcutaneously or intravenously should be instantly available, since the circulating fluids of the body may be maintained in this manner until a transfusion can be arranged.

Often the first consideration in cases of active bleeding is the treatment of shock. The foot of the bed should be elevated, the patient should be kept warm, and sedatives (usually morphine) should be administered. Later, pentobarbital sodium (nembutal) or other barbiturates may suffice. The traditional ice bag to the abdomen is probably unimportant. If the patient is in severe shock, infusion of a solution of 6 per cent acacia may be employed as a temporary substitute for blood. The restoration of lost body fluids is obviously important since the loss of fluid in these cases is large, particularly because of the profuse sweating and diarrhea which so commonly accompany hemorrhage; in older individuals the danger of extrarenal azotemia or even renal insufficiency is large. As Noth and Wilbur[26] have noted, fluids are best given subcutaneously, but once active bleeding has ceased, the intravenous route may be employed, particularly if the output of urine falls off markedly and if the blood urea rises. Until such time as fluids can be given by mouth, at least 2 to 3 liters of fluid is a minimal requirement.

Transfusion.—One of the most obvious and important immediate steps to be taken is to provide for a generous number of blood donors from among the patient's relatives and friends, since there are few patients with profuse hemorrhage from ulcer who will not require the administration of blood at some time. The rationale of employing blood transfusion in the treatment of active gastroduodenal hemorrhage has been considered by many writers. One school feels that transfusions should be withheld in order that a rise in blood pressure may not dislodge any newly formed thrombi at the site of hemorrhage; obviously if severe or massive bleeding occurs this need not apply because of the absolute necessity of preventing exsanguination. Most authorities on the subject now believe that the danger of transfusion increasing the rate of blood loss is small and that there are more lives lost by withholding transfusion than by overdoing the administration of blood. In many hospitals, massive transfusions by the drip method are now employed according to the method of Marriott and Kekwick.[21] These authors advocate the administration of blood by continuous venoclysis at a rate that will produce a 10 per cent rise in the concentration of hemoglobin in each four-hour period. Translated into terms of blood administered, this amounts to from 100 to 135 c.c. of blood per hour; 4 or 5 liters, or even more, of blood may be given over a period of forty-eight hours or longer. Such large amounts of blood require a "blood bank," or an unusually generous supply of donors, but they may be lifesaving measures in cases of massive hemorrhage. Not many patients will require these massive transfusions, but there are hardly any individuals who have sustained even a moderately severe loss of blood who will not be greatly helped by the administration of one or several small transfusions (250 to 350 c.c.).

Gastric Lavage.—The use of this procedure to determine the rate of blood loss and to apply coagulants directly to the site of hemorrhage has been both endorsed and decried. It has been suggested that a catheter be introduced into the stomach with the idea of determining whether or not arterial blood is present. If bright blood continues to flow through the catheter one may suspect erosion of a large artery. This is probably a useful point. The administration through the intragastric tube of ice water, epinephrine, and other substances to produce coagulation, is of very doubtful value. Recently, the use of snake venom as a hemostatic has been advised, but no data have been presented to prove its merit. Wangensteen[36] has employed intubation of the stomach with suction attached, chiefly because of the danger of acute perforation in the case of an actively bleeding and inflammatory ulcer; this danger, however, is admittedly small (2 to 3 per cent).

Diet.—How long should food be withheld after a hemorrhage? It was formerly the practice to give nothing by mouth for at least four days or until the stools were free of blood, but this plan of treatment is gradually being abandoned. Meulengracht[22] was the first to suggest the early and liberal administration of food; he claimed a very substantial reduction in the mortality rate as a result of this innovation. His method of procedure is rapidly gaining favor for three reasons: (1) a well-filled stomach, according to Christensen,[14] has considerably less peristaltic activity than an empty one; (2) in the patient with no involvement of a large vessel bleeding is probably self-limited, the administration of food, therefore, serving only to hasten convalescence and to take care of any protein depletion or vitamin deficiency which may have existed, and (3) the patient with an open artery is not harmed, since bleeding will continue to occur no matter what is done.

A great many conservative clinicians and gastro-enterologists have been impressed with the Meulengracht treatment and it is now being adopted, with some modifications, in this country. It has been our practice at the clinic to withhold food for from twenty-four to forty-eight hours or until such time as evidence of rapid loss of blood is no longer apparent. After this period, small hourly feedings of ice water, gruel, milk, and sweetened fruit juices are allowed and, if no further bleeding occurs, the patient is allowed to take a generous soft diet in the form of five or six feedings at appropriate intervals on the following day. Alkalis may or may not be administered, depending on whether or not ulcer pain is present.

The Surgical Treatment of Massive Hemorrhage

Any discussion of surgical treatment in relation to bleeding ulcer involves two considerations: (1) the problem of the individual with recurrent hemorrhage, and (2) the matter of surgical intervention in the face of acute bleeding. The first consideration is beyond the scope of this discussion, but it may be said briefly that the age of the patient, the frequency and severity of the hemorrhages, the interval between them and the circumstances associated with each, must be taken into account and that each case represents an individual problem for which no hard and fast rules can be established. The most reliable treatment for repeated and severe hemorrhage from peptic ulcer is partial gastric resection; more conservative measures, such as gastro-enterostomy or pyloroplasty, fall short of the mark and, in fact, even with large resections the protection against hemorrhage is not absolute. Gordon-Taylor's[18] recent paper may be recommended as the best expression of surgical opinion on this debatable subject.

The question of surgical intervention in cases of acute hemorrhage has been well discussed by Balfour[8] in a recent editorial. The objections to a direct surgical attack on the bleeding point under these circumstances are four in number: (1) no actual ulcer may be present, or even if it is, it may not be found; (2) conservative procedures like gastro-enterostomy are inadequate to prevent further loss of blood; (3) the risk of resection, the only relatively certain method of attack, is almost prohibitively high under these circumstances, and (4) if more than three or four days have elapsed since the first hemorrhage, the risk even for simple exploration and ligation of vessels in the vicinity of the ulcer reaches formidable proportions. In favor of surgical intervention it may be said: (1) that there is no other way of controlling the bleeding from an open artery; (2) the mortality rate of conservative medical treatment in cases of severe bleeding, particularly in older individuals, is also extremely high; (3) that if subacute perforation or obstruction are present these can be dealt with surgically, and (4) it is often possible to get patients into very satisfactory condition by the continued use of the drip method of transfusion and the continued transference of large quantities of blood, extensive surgical procedures thus being made possible. We at the clinic have had some recent successful experiences with direct attack on an uncontrollable bleeding ulcer; other workers, including Allen[1] and Gordon-Taylor,[18] have felt that such radical steps are taken too infrequently.

No indications for surgical intervention can be laid down for the treatment in any individual case; suffice it to say that a surgeon should be called in consultation in cases of actively bleeding ulcers and that all preparations should be made for surgical interference in the event that bleeding continues. This requires a high degree of courage and decision on the part of the surgeon as well as careful organization of both the medical and surgical services of the hospital in question and the availability of large amounts of blood for transfusion. Early surgical intervention is much to be preferred once a decision is made as to the probability of arterial bleeding. In fact, there are many surgical authorities who feel that a direct surgical attack on the bleeding ulcer is rarely successful after more than forty-eight hours have elapsed since hemorrhage began.

Summary and Conclusions

The clinical course, mortality rate, complications and treatment of acute gastroduodenal hemorrhage have been considered. The available evidence indicates that serious bleeding occurs in from 15 to 30 per cent of cases of peptic ulcer and that it is probably responsible for about 30 per cent of all deaths from peptic ulcer. Fatal hemorrhage is chiefly due to the erosion of large and arteriosclerotic vessels in older patients. Under these circumstances the only hope of saving the patient is direct surgical attack on the bleeding lesion. Serious hemorrhage also may arise from relatively insignificant lesions of the stomach and duodenum, some of which may form on the basis of minor inflammatory lesions of the mucosa whereas others may depend on vitamin deficiencies. The treatment of such lesions is preferably conservative.

The Meulengracht method of treatment, that is, a liberalization of diet and early feedings after active hemorrhage has ceased, has many advantages in the management of such cases. The difficulties, of course, are that the nature of the local lesion and the type of bleeding occurring from it cannot be determined with any certainty except in a relatively small group of cases. The duration of the individual hemorrhage, the age factor, the previous history and the availability of proper facilities for maintaining the blood at a point above the level of exsanguination often influence the decision as to the desirability of a direct surgical attack.

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Discussion

Dr. P. W. Harrison, Worthington: I am glad to have the privilege of discussing the very excellent paper just read by Dr. Snell. Hemorrhage of any type is very dramatic and frequently most alarming to the patient and his family, as well as to the physician.

Dr. Snell has shown that the probable incidence of serious bleeding as a complication of peptic ulcer is between 15 and 30 per cent. He has also presented what statistics are available for the Minnesota area, which tend to show that in this region fatal hemorrhage occurs in less than 5 per cent of the cases observed. He has also indicated the general agreement that fatal hemorrhage is chiefly due to the arrosion of large arteries, particularly in sclerotic vessels in older patients.

Goldman reported that at San Francisco Hospital 70 per cent of all hemorrhages from peptic ulcers occurred in patients over forty years of age, and that fatal hemorrhage was rare before the age of forty. He, too, stressed that exsanguination usually was the result of bleeding from a large artery, particularly in the presence of arteriosclerosis.

While each case must be individualized, it would appear that the need for immediate surgical intervention is most likely to be definitely required in this older group with continued or repeated hemorrhages. Surgery in this group of cases is likely to be a very formidable procedure. First, the patient is a bad risk because of lowered resistance from his bleeding. Second, too frequently the only procedure which offers any hope of relieving the situation is a radical removal of the ulcer bearing area at a most unfavorable time, because of the accompanying inflammation and edema. This is particularly true of those ulcers on the posterior wall of the duodenum.

It would appear that the immediate treatment of the majority of cases of bleeding from duodenal or gastric ulcers will be conservative.

The first concern is frequently the treatment of shock. The usual external heat and sedatives are important. If the shock is severe, gum acacia may be used intravenously to support the blood volume. However, I would stress the immediate provision of donors. If the appearance of urgency continues, I believe that either repeated small blood transfusions (125 to 300 c.c.) should be given or after the first one or two transfusions, the drip method of Marriott and Kekwick be instituted. With threatened exsanguination, there of course can be no dispute about the value of transfusion, but even in those hemorrhages of lesser degree, it would seem that more good than harm can be accomplished by slow transfusion, both for the replacement of blood and for any possible hemostatic effect. I believe that the most common error is in expecting too much from one or two small transfusions.

The generally accepted medical treatment of these cases includes starvation for twenty-four to forty-eight hours, or even longer, and then a prolonged period with a greatly restricted diet, accompanied by the use of alkalies.

Meulengracht has introduced the idea of early liberal feeding of finely minced food. He offers a series of 273 cases of pure ulcers and erosion treated for hemorrhage in which early liberal feeding was used and states that the mortality rate has been reduced from an expected 8 to about 1 per cent. He doubts that food has any hemostatic effect, but believes that general exhaustion and the effects of anemia accentuated by starvation, lack of water, salts and vitamins are greatly reduced by feeding.

Boyd and Schlachman of New York have a small series of cases which they feel tends to corroborate Meulengracht's findings. They also present evidence to show that with this regimen there is more prompt relief of subjective symptoms, quicker regeneration of blood and a definite shortening of the period of disability. This work is impressive enough to warrant very serious consideration.

HEART DISEASE IN PREGNANCY*

JOSEPH F. BORG, M.D.
Saint Paul, Minnesota

WHILE the risk of child-bearing in the cardiac patient has been markedly reduced in recent years, the mortality of pregnancy associated with heart disease is still three times as great as that of uncomplicated pregnancy. There is much reason to believe that this situation is entirely unnecessary and can be markedly improved by intelligent medical management.

The marked increase on the burden of the circulation which occurs in pregnancy has long been recognized.[1, 11, 13] Only recently has the true extent of this been known and the contributory factors demonstrated. Most of these enter into consideration after the fourth month. Naturally prominent among them is the increase in metabolism of about 15 per cent, associated with an increased thyroid activity. The heart rate is elevated fifteen to twenty beats per minute. The venous pressure in the pelvis and legs is definitely increased. The circulating blood volume becomes demonstrably enlarged and there is a gradual increase in the minute volume output, amounting to about 50 per cent at term.[17] This may increase further during labor, but gradually recedes to normal about four weeks post partum. An important factor not generally considered is the development of large new blood channels in the placenta, over which a bruit may be heard. These act similarly to an arteriovenous aneurysm in increasing the heart burden.[1] As a result of these stresses may be explained a definite enlargement of about 10 per cent in the heart size. This appears even larger in the teleoroentgenogram due to the upward displacement of the diaphragm in the later months of pregnancy.

These conditions are continuous burdens on the resting heart. They have been shown to throw their maximum strain on the circulation at about the seventh month, at which time the greatest danger of myocardial embarrassment exists. They are well borne by the normal organ and heart failure does not occur, but where heart disease is present the patient may not be able to retain her compensation or the reserve may be so narrow that seemingly innocuous factors may precipitate its breakdown.

Owing to the fact that about 10 per cent of pregnant women present symptoms or signs which may suggest the presence of heart disease while only about 2 per cent actually have such a disorder,[7] careful study is necessary to distinguish the latter cases. Breathlessness at accustomed tasks, haphazard chest pains, dizziness, palpitation, faintness, systolic murmurs, edema, increased heart size, altered heart tones and increased pulmonary markings may all be noted in pregnant women with normal hearts.[7, 8] When due to cardiac disease these will disappear after delivery unless a neurocirculatory asthenia remains to account for some of the symptoms. Significant of heart disease is the presence of more marked cardiac enlargement with characteristic outline changes, diastolic murmurs associated usually with a definite history of a probable etiologic factor, and often some of the other signs and symptoms mentioned.

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As is to be expected in the age group considered, rheumatic heart disease predominates markedly, comprising about 95 per cent of all pregnant women with heart trouble.[2] About 2 per cent have congenital heart disease of various types. The remainder are accounted for by the rare cases of hypertensive heart disease, subacute bacterial endocarditis, hyperthyroidism, and the few of indeterminate origin. Of those with rheumatic heart disease the great majority have mitral stenosis, uncomplicated or with aortic valve disease, and a few have aortic valve disease alone.

After the diagnosis of heart disease has been made, the problem of management must be approached. This can be considerably facilitated by employing the functional classification of the American Heart Association as shown in Chart I. Regardless of the anatomic or etiologic diagnosis, this classification will prove of marked value, although it has its limitations. These are illustrated by the fact that the patient may shift from one class to another while under observation, and there are borderline cases where differences of opinion will exist among different observers regarding their class designations.

Of greatest importance in the recognition and treatment of these patients is the prenatal care.[17] About half of them enter pregnancy unaware of the presence of heart disease. Examination in the early months may enable the diagnosis to be made more easily since the rather common symptoms which may be confused with heart trouble do not usually appear at that time. Once diagnosed, proper management and advice will markedly reduce the chances of cardiac embarrassment in the later months of pregnancy when the burden on the heart is much greater. The importance of such care is shown in the observations of Lamb,[12] who reports a mortality of 20 per cent where the patients were first seen in a decompensated state and 2.2 per cent in the group where compensation was good. Fitzgerald[5] reports no mortality in 192 pregnancies associated with serious heart disease. Scott and Henderson[16] report double the incidence of cardiac failure in charity clinic patients as compared with private patients. The results of all other workers attest to this situation and fully justify the earlier statement to the effect that mortality among pregnant cardiac patients should be little different from the average mortality in pregnancy.

CHART I. AMERICAN HEART ASSOCIATION FUNCTIONAL CLASSIFICATION

I. Patients with organic heart disease able to carry on ordinary physical activity without discomfort.
II. Patients with organic heart disease unable to undertake ordinary physical activity without discomfort.
    (a) Activity slightly limited.
    (b) Activity greatly limited.
III. Patients with organic heart disease and with symptoms or signs of heart failure when at rest, unable to undertake any physical activity without discomfort.

Patients falling in class I and IIa seldom have serious difficulty going through delivery. Nevertheless they are not immune to the precipitating causes of heart failure which may throw them into class IIb or class III, where their management is a very serious matter, and a high mortality exists. This eventuality should never occur with proper handling of the patient who will cooperate. Decompensation rarely occurs without a definitely demonstrable precipitating cause,[1] such as over-exertion, mental overstrain, and infections with their tachycardia and fever. These are important to avoid. Also to be recognized for the increased burden which they put on the heart and for their amenability to treatment are such conditions as anemia, obesity, and dietary deficiencies, especially Vitamin B. If these patients carry through the seventh month, the period during which the circulation is under most severe strain,[11] a normal delivery should be effected without signs of undue cardiac embarrassment. However, extremely cautious prenatal observation and advice for all these women is necessary, since there are no criteria by which the patients who are most likely to have trouble can be selected. Of prime importance to be stressed is the need for frequent observation from early pregnancy. The patient should report every two weeks to the sixth month, and weekly thereafter, with instructions to inform the physician at any time if undue fatigue, dyspnea, edema, palpitation or cough are experienced. This must be emphasized because when failure appears it is often sudden in its onset. The need for sparing the circulation through adequate rest and avoidance of shopping tours, limitation of stair climbing, and restriction of weight gain are important. The strain of receiving visitors, family illness, household moving, etc., are not to be forgotten. To bed with any intercurrent illness, after calling the physician, is a strict rule. During the seventh and eighth months all activities should be even more limited.

At the periodic examinations keen judgment is sometimes required to ascertain the significance of symptoms which may be given. More definitely indicating the onset of failure are the appearance of basal râles in the lungs, cough, prominent jugular pulsation, liver tenderness, marked weight gain and paroxysmal dyspnea. Effort tests and vital capacity determinations in the latter months may be misleading. Should decompensation appear, absolute bed rest with the usual regime of treatment of heart failure is indicated. As a rule the patients respond well.

Even if no suggestion of myocardial overstrain appears in the class I or IIa patients, they should still be placed in the hospital if possible two weeks before anticipated delivery,[17] or a very strict home care pursued. Labor is usually carried through without difficulty, although forceps delivery, after full cervical dilatation, is indicated if there develops a heart rate greater than 115, or a respiratory rate over twenty-eight.[4] A curve of the latter two observations charted at ten minute intervals during labor will be of value in pointing to the onset of undue myocardial fatigue. A rising curve, especially if associated with dyspnea, may be the forerunner of a severe decompensation. If full dilatation has not occurred, any interference will only aggravate the situation. Morphine must now be used for rest, and the usual treatment of heart failure instituted.

Treatment of class IIb and class III patients is much more difficult for it is among these that almost the entire mortality from heart disease is found. Women whose heart condition has ever justified such classification prior to pregnancy should never become pregnant, and those who enter these groups after becoming pregnant have either been poorly advised or unable for some reason to follow instructions. Patients seen in the first trimester who have previously had decompensation or who enter pregnancy in this state should not be permitted to carry on to delivery,[3] and therapeutic abortion is advised before the fourth month, after the decompensation has been treated in the usual manner. Further pregnancy should be made impossible in these patients.

Class IIb patients seen later than the third month require careful observation, much rest, and medication directed toward supporting the heart. If there is no history of congestive failure and the patient is a multipara, spontaneous delivery usually is effected. If this patient goes into class III the failure is treated, and if successful, cesarean section is justified at term.[10, 15]

Class III patients first seen beyond the third month are treated likewise. Medical treatment of the heart failure is most important. Delivery of this class of patients by any known method carries more than 50 per cent mortality,[4, 9] and operative interference is nearly always fatal. If these patients fail to respond to medical treatment, therefore, their interests are best conserved by letting nature take its course,[12] and permitting spontaneous delivery in bed. Rest periods effected by morphine are indicated in such conditions.[4] It can thus be seen that the serious problems are those brought about by delay in reporting for prenatal care, and are therefore to be considered usually preventable.

The question of sterilization always[4, 17] arises when dealing with class IIb or class III patients, whether first seen in those classes or otherwise. Numerous observers advise it when cesarean section is performed, or later. Many factors,[17] religious, social and economic, must be considered when this problem arises, but in any event further pregnancies should be most emphatically discouraged.

The choice of anesthesia in the cardiac patient will depend on the skill and experience of the anesthetist.[13] Ether is widely used, but ethylene,[1] cyclopropane, and spinal anesthesia are proving quite satisfactory.

The prognosis for the pregnant woman with heart disease is good provided competent medical supervision is followed. The knowledge that rarely does a class IIb or class III patient fail to respond to treatment in the first attack of decompensation, and that the deaths are practically always those with heart failure histories, points to the fact that this problem should not be too difficult to handle. Every woman with heart disease is entitled to one or two children[6, 18] provided she has not had a cardiac breakdown, and is economically so situated that the raising of a family is not judged to be too great a burden. However, certain patients should never become pregnant, and, if they do, interruption is justified. This obtains where there is a history of heart failure,[3] presence of auricular fibrillation,[7, 11] signs of serious heart muscle damage in the electrocardiogram, active endocarditis or serious complications as tuberculosis, hypertension or nephritis. To such patients should be stressed the danger of further pregnancies, and contraceptive advice or sterilization may be seriously considered.

It has been definitely shown that the age of the patient is an important factor in the chance of carrying through a normal pregnancy, women over thirty-five years of age displaying a markedly higher death rate.[2] Studies on the remote effect of pregnancy on the heart diseases are extremely difficult and no convincing conclusions have been reported, although those who express an opinion are satisfied that repeated pregnancies tend to reduce the span of life and increase the danger of death from heart failure.[6, 9] It is safe to say that "any patient with organic heart disease should be regarded as a case of potential heart failure, because there is no known formula to tell which cases will go through safely and which will not."[3] Many of these women will carry safely through pregnancy but sustain increased heart damage. Frequently repeated is the opinion that the cardiac patient has an easy delivery. Careful observation does not bear this out. Most important in the matter of prognosis is the fact that it can be greatly determined by the coöperation of the patient and intelligent management by the physician.

Finally, it may well be emphasized that here we are dealing with a problem which often requires a great deal of intelligent thinking and keen judgment. This is most satisfactorily provided where it is possible to have the coöperating observation of the cardiologist and the obstetrician, as it has been repeatedly shown that the best results in handling these situations have been obtained where such coöperation existed.

Summary

1. The nature of the increased load on the heart in pregnancy and its significance when that organ is diseased are discussed.
2. The presence of many signs of heart embarrassment in patients without heart disease is pointed out and the separation of these women from those affected by heart disease is shown to be of importance.
3. The problem of heart disease in pregnancy is chiefly that of the rheumatic heart.
4. Classification of these patients according to the functional classification of the American Heart Association will greatly aid in the management of the individual case.
5. The significance of heart disease in any pregnant woman is determined in great part by the character of the prenatal care, the most important element of treatment.
6. Management of these patients consists primarily in considering each an individual problem. The functional classification aids in determining the measures to be employed.
7. Heart failure in pregnancy is treated in the usual manner. Its effects on the pregnancy vary in seriousness with the therapeutic response of the decompensation.
8. The prognosis of heart disease in pregnancy should be good under proper management with no significant increase in mortality.

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Discussion

Dr. E. M. Kasper, Saint Paul: It is altogether fitting that the subject of heart disease and pregnancy should be presented by an internist, for a woman who presents herself with these two conditions should be considered as a case of heart disease complicated by pregnancy and not as pregnancy complicated by heart disease.

As usual, Doctor Borg has very ably presented his subject. Every sentence contains much meat which must be digested, and I believe that all of us should read carefully all that he has said when his article is published.

In this condition, we again find what can be accomplished by adequate prenatal care. The mortality rate which used to be above 10% has now been reduced to nearly 2%. Nevertheless, heart disease still ranks high in the causes of maternal deaths, about fifth, I believe. Nearly 1,000 mothers die each year from this condition in the United States alone!

Because many women do not realize that they have heart disease, a great responsibility falls on the obstetrician to discover its presence. Anyone can diagnose easily cardiac decompensation, but when that occurs it often is too late to be of much help, for at least 50% of these women die. Instead, it is up to the obstetrician who firsts sees this patient to be able to differentiate between a normal and an abnormal heart during pregnancy and so be able to get the abnormal heart under treatment early.

Rarely will a cardiac patient ask our advice as to whether she should get married, and it is not common to have a married woman with cardiac pathology ask whether she should have children. What more commonly happens is that a cardiac patient who is pregnant will want to know if she can carry safely through her pregnancy. Such problems must be very carefully considered and all factors must be weighted before an answer can be given. Close coöperation between patient, obstetrician and cardiologist is necessary in order to come to the correct conclusion.

The heart specialist should share in the care of an obstetrical patient with heart disease throughout pregnancy, labor and the puerperium. It is very hard to generalize, in considering these cases, for every case should be individualized. However, I believe that a woman who has not suffered from decompensation should be able to carry through a pregnancy to or near term. The question of an interruption of pregnancy so often arises but, using the words of Jensen in his excellent book, The Heart of Pregnancy,—"It (abortion) should now rarely be performed, for either a woman should not undertake pregnancy or she should be capable of carrying it through."

Heart failure is the indication for interruption of pregnancy but under no circumstances should interruption, whether early or late, occur when decompensation is present. If failure occurs before the 16th or 18th week, an abortion should be done. If later, it may be deemed advisable to carry the patient until the fetus is viable. Delivery is performed in the manner which is easiest for the mother and child, and at this stage, I prefer cesarean section. However, most cardiac cases are carried to term without trouble developing, but it is during labor that decompensation is most likely to occur. The obstetrician and the cardiologist must both be in constant attention at this time.

If no signs of cardiac embarrassment are encountered, usually routine procedures of labor can be followed, but if symptoms of cardiac trouble develop, the patient must be rested as much as possible, treated medically by the heart specialist and forceps applied after complete dilatation of the cervix is accomplished in order to spare the mother expulsive efforts. Occasionally early in labor, a cesarean section might be done though rarely is this necessary.

Our problem does not stop in the delivery for strict observation should be continued during the puerperium. If any interference has been necessary, there is an increased danger of infection, hemorrhage and shock. When there has been no decompensation, there is no contra-indication to lactation.

I would like to recommend to every one the recently published book by Julius Jensen. He has very thoroughly covered every angle of this subject.

FOREIGN BODIES IN CORNEA: CARE AND COMPLICATIONS

W. T. WENNER, M.D.
St. Cloud, Minnesota

FOREIGN body in the cornea is the most frequent eye injury encountered. In an analysis of injuries occurring in industry it comprised 60 per cent of all cases. For this reason it should merit most careful consideration.

In examining an eye for injury, it is paramount to have good illumination and proper magnification. This applies to the detection and removal of corneal foreign bodies. Before removing such a foreign body, the cornea should be thoroughly anesthetized. The ideal drug for topical anesthesia should be non-irritating, not drying to corneal epithelium, and should not cause dilatation of the pupil, but at the same time it should give good anesthesia. Cocaine is not a good anesthetic as it causes drying of corneal epithelium and dilatation of the pupil. There are various solutions on the market that most nearly meet the above requirements: butyn, metycaine or nupercaine in two per cent solution, and pantocaine in one-half or one per cent solution. Three to four instillations, allowing a few minute intervals between instillations, usually give sufficient anesthesia. It is only in the highly inflamed eye that more instillations are required.

After good anesthesia has been obtained, the foreign body is removed. The instrument of choice for removing a corneal foreign body is a sterilized sharp spud. This allows clean removal with a minimum of damage to the remainder of corneal tissue. If the foreign body is magnetic, one should use the magnet.

If the foreign body is iron, it is readily disintegrated into the ferric salts which are irritating to corneal tissue. In removing this type of foreign body, it is essential to remove the brownish red pigmentation and the layer of oxidized tissue surrounding the foreign body. This is best accomplished with a corneal burr. One can use an ordinary dental burr with fine markings fitted into a chuck handle, rotating it between thumb and fingers directly over the foreign body crater. It will smooth the edges of the crater, add to the patient's comfort and lessen the dangers of corneal ulcer developing. After using the burr in these and similar cases, less postoperative reaction follows and a definite decrease is noted in the incidence of the infiltrative type of ulcer. These are the cases in which, following removal, the patient returns in a day or two with a red eye and infiltration at the site of the foreign body. This is most frequently due to incompletely removing the slough immediately surrounding the foreign material, and for this reason the use of the burr is recommended.

TABLE I.

1,069 Cases		Average Elapsed Time from Injury to First Treatment
Total number foreign bodies	1,663	1.96 days
Number uninfected foreign bodies on first examination	1,476	1.37 days
Number foreign bodies with ulcer present on first examination	187	7.00 days
Number ulcers following foreign body removal	27	1.5 days

After the foreign body has been cleanly removed, it is good practice to instill an antiseptic ointment which contains some type of an anesthetic—butyn-bichloride, butyn-metaphen, or metycaine-merthiolate—and apply an eye pad firmly. The patient is advised to leave the pad in place over night. Experience has shown that this type of dressing results in more comfort, less irritation, less manipulation on the part of the patient, and therefore, more prompt healing and fewer complications. When the patient has only one seeing eye, it is not practical to apply the above dressing, in which case instilling the ointment usually suffices. Some oculists advocate in these cases the application of a minute amount of carbolic acid to the denuded area with a sharpened wooden applicator, care being taken to remove all the excessive acid from the applicator to prevent its spreading to the clean cornea. If the eye shows any inflammatory reaction, the pupil is always dilated with homatropine or atropine, depending upon the age of the patient.

All corneal wounds should be considered serious until proven otherwise by healing. The danger of any corneal injury is corneal ulcer with a resulting scar, or an extension of the infection to the inner structures of the eye with resulting perforation sometimes necessitating enucleation.

What is the pathogenesis of corneal ulcers following the removal of a superficial foreign body? All foreign material in the cornea should be removed promptly to prevent inflammation, sloughing and ulceration of the surrounding layers of tissue, which represent nature's method of accomplishing removal of foreign bodies if left undisturbed. The material that caused the injury may itself inoculate the cornea directly with bacteria. Ordinarily, however, one has to deal with a secondary invasion of bacteria into the small wound, for the infection is generally caused by bacteria which scarcely ever are found on the foreign bodies that cause the injury, but are found very commonly in the conjunctival sac. For this reason, in all cases where corneal epithelium is broken—as from an abrasion or foreign body—the lacrimal drainage system should be inspected. If the tear sac is infected it should be removed, or if this is impractical, precaution should be taken to render it as free from danger as possible. The puncta

TABLE II. DISTRIBUTION OF FOREIGN BODIES OF THE CORNEA ACCORDING TO OCCUPATION

Occupation	Number Foreign Bodies	Percentage of Total Foreign Bodies (1,663)
Granite	652	39.2
Industry Hilger, Iron, Pulp, Paper, Diamond, Aluminum	328	19.8
Farm	143	8.6
Laborer	131	7.9
Student	93	5.6
Railroad	64	3.8
Mechanic	60	3.6
Clerical	41	2.4
Housewife	28	1.7
Miscellaneous Teachers, Children, Salesmen, etc.	123	7.4
	1,663	100.0

TABLE III. INCIDENCE OF ULCERS FOLLOWING TREATMENT OF FOREIGN BODIES ACCORDING TO OCCUPATION

Occupation	Number Foreign Bodies	No. Ulcers Following Treatment	Percentage
Granite	652	12	1.8
Industry	328	4	1.2
Farm	143	2	1.3
Laborer	131	1	0.76
Student	93	1	1.07
Railroad	64	2	3.1
Mechanic	60	2	3.3
Clerical	41	1	2.4
Housewife	28	0	0.0
Miscellaneous	123	1	0.81
	1,663	27	
	Average incidence, 1.62%		

TABLE IV. INCIDENCE FROM FOREIGN BODIES ON FIRST EXAMINATION ACCORDING TO OCCUPATION

Occupation	Number Foreign Bodies	Number Ulcers Present	Percentage
Granite	652	42	6.4
Industry	328	23	7.0
Farm	143	42	29.3
Laborer	131	14	10.6
Student	93	21	22.5
Railroad	64	7	10.9
Mechanic	60	7	13.3
Clerical	41	4	9.7
Housewife	28	5	17.8
Miscellaneous	123	21	17.0
	1,663	187	
Average incidence, 11.2%			

in many of these cases may be sealed by actual cautery.

What is the ulcer incidence after removal of corneal foreign bodies, as well as the incidence of ulcers in foreign body cases when first seen with a corneal foreign body present? The following is a review taken from our records over a period of ten years. These foreign bodies were removed either by the late Dr. John J. Gelz, Dr. Joseph B. Gaida, or by myself.

Incidence of Ulcers from Non-perforating Foreign Body Injuries of the Cornea

The number of patients seen with foreign bodies of the cornea in the last ten years has totaled 1,069; the total number of foreign bodies, 1,663. Many of the industrial employees have had repeated injuries.

The average time that these 1,663 foreign bodies were seen after the injury was sustained was 1.96 days.

Twenty-seven or 1.62 per cent of the 1,663 foreign bodies, were accompanied by ulcers following examination and treatment. The surprising factor here is the time elapsing between injury and the time attention was sought, an average of 1.5 days. Of the twenty-seven ulcers eleven were of the infiltrative type and sixteen of the foul type of ulcers.

Of these 1,069 patients, 175, or 16.3 per cent, had a total of 187 ulcers already present when attention was first sought. This gives an incidence of 11.2 per cent in the 1,663 foreign body cases. Eight of the 175 patients had a total of twenty ulcers in this time period. The average elapsed time before seeking medical attention in the cases where ulcers were found on first examination was exactly seven days, as compared with the average of 1.37 days of group without infection.

There were sixty-five of the infiltrative type, and 122 of the foul type of ulcers seen in these 187 cases. Two of these ulcers perforated, and one finally necessitated an enucleation. One required a Sæmisch incision which also resulted in a total loss of vision.

Twenty-three per cent of the patients that presented themselves with ulcers present at first examination had been seen and treated by someone previously and were referred because of irritated, red eyes. Many of these had the infiltrative type of ulcer resulting from incomplete removal of the foreign body. They cleared promptly on using the burr and cleansing the foreign body crater.

The striking significance of these tabulations is that the lowest incidence of ulcers is in granite and industrial workers which are compensation cases and are instructed to seek medical aid as soon as an injury occurs. Even in these, many instances are found where fellow workers attempt removal, and only if the eye continues to irritate do they seek medical attention. The incidence is highest in farmers and students where delay in seeking attention is the greatest.

TABLE V. INCIDENCE OF OPACITIES RESULTING IN VISUAL LOSS

Forty-nine opacities in a total of 214 ulcers	22.9%
Forty-nine opacities in a total of 1,663 foreign bodies	2.9%
Three opacities in 27 post-treatment cases	11.1%
Forty-six opacities in 187 pre-treatment cases	24.6%
Three post-treatment opacities in 1,663 foreign bodies	0.18%
Forty-six pre-treatment opacities in 1,663 foreign bodies	2.70%

Opacities reported are only those involving the pupil area and those that resulted in visual loss, which varied from 5 per cent to total loss. These figures bring out that visual loss incidence was greatest in patient having an ulcer present when the patient reported for treatment. Usually a period of three to nine months was allowed to elapse before recording the final loss, as in many instances superficial macula would thin, resulting in improved vision. The total incidence of loss for the entire series as seen in above figures is 2.9 per cent, which is comparatively small.

Conclusions

1. Foreign bodies in the cornea should be treated as surgical emergencies.

2. Ulcer incidence following foreign body injury to the cornea is more frequent in patient having a foreign body present over a period of time.

3. The highest incidence is in farmers and farm workers.

4. The lowest rate is in industrial workers. These patients are required to report early for treatment.

Discussion

Dr. E. P. Burch, Saint Paul: We should consider ourselves deeply indebted to Dr. Wenner for the comprehensive manner in which he has presented this paper on the management of foreign bodies of the cornea. Injuries of the cornea constitute the most common eye emergency that the general practitioner, as well as the ophthalmologist, is called upon to treat. They are as a rule attended by considerable discomfort and their sequelæ may result in considerable loss of vision if improperly treated.

It is not my intention to discuss the routine technical or statistical aspects of Dr. Wenner's paper, but rather to emphasize a few points in regard to the prevention and therapy of complications which may follow lesions due to foreign bodies of the cornea.

It should be remembered that many corneal lesions become infected by the pneumococcus group of organisms which are nearly always present in the lacrymal sac. It is advisable in all foreign body cases to be sure that the tear sac is free from low-grade inflammation, for a retrograde infection from this source is often of considerable virulence and difficult to treat.

Chemical cauterization of the damaged corneal area has been mentioned. The work of Gunderson on the iodine therapy of herpetic lesions of the cornea has conclusively demonstrated the effectiveness of iodine solution as an antiseptic in external infections of the eye.

The strong solution of iodine (U.S.P.) which contains seven per cent iodine and five per cent potassium iodide is extremely well tolerated by the cornea and conjunctiva if immediate neutralization with 4 per cent cocaine is carried out. The combination of iodine and cocaine results in the precipitation of insoluble cocaine iodide.

It has been our routine practice to apply the full strength iodine to all corneæ immediately after removal of foreign bodies, and then to flood the conjunctival sac with a solution of four per cent cocaine. The iodine is applied to the cornea by means of a finely pointed toothpick applicator wound with sterile cotton. This procedure is also employed in many cases of infected ulcer. No harmful effects have been noted and it is felt that the number of infections following trauma has been appreciably diminished. Tincture of iodine has the advantage of being readily available, and if nupercaine ointment is instilled in the conjunctival sac the patient experiences little or no discomfort.

In cases of frank infection it is often desirable to employ a stronger cauterizing agent. For this purpose trichloracetic acid is highly effective. After corneal anesthesia is established, the infected area is touched with a minimum amount of a freshly prepared aqueous solution of trichloracetic acid. Care must be exercised to avoid an excess of the chemical and the cauterization should be carefully confined to the infected area.

It has been noted that uninfected corneal abrasions tend to heal more rapidly when the intraocular tension is lower. To this end, if there be no threat of iritis, a 1 or 2 per cent solution of pilocarpine instilled in the conjunctival sac will bring about more rapid regeneration of the corneal epithelium.

If there is an associated iritis, foreign protein therapy with intravenous triple typhoid injections followed by paracentesis of the anterior chamber, the so-called interference therapy of Brown, will result in an increased concentration of antibodies in the aqueous with beneficial effect upon the inflammatory process. If an extensive ulcer results from trauma despite energetic local and general measures, so that perforation of cornea and panophthalmitis is threatened, a delimiting keratotomy may be considered. Another maneuver which may prove useful in deep uninfected wounds of the cornea is conjunctivoplasty, the cornea being covered by a sliding conjunctival flap to promote healing and prevent kerectasia.

CASE REPORT

TREATMENT OF HEMORRHAGIC RETINITIS WITH THE ANTI-HEMORRHAGIC VITAMIN: PRELIMINARY REPORT

EDWARD P. BURCH, M.D., and JOHN R. MEADE, M.D.

Saint Paul, Minnesota

THE initial report of an anti-hemorrhagic factor in the diet of chicks which protected them against hemorrhagic diatheses was made by Dam[1] in 1935. He termed this factor vitamin K. In 1937 Snell[2] reported the successful use of this substance in the control of hemorrhage in patients suffering from jaundice. His experience led us to believe that vitamin K might be of value in certain types of retinal hemorrhage.

In some cases of retinal hemorrhage none of the usual causes such as hypertension, arteriosclerosis, diabetes, nephritis, the blood dyscrasias, and tuberculous periphlebitis are found after exhaustive clinical and laboratory examinations. This group of unexplained hemorrhages constitutes the so-called idiopathic hemorrhagic retinitis which it was believed might be benefited by treatment with the hemorrhagic factor or factors contained in the fat-soluble substance termed vitamin K. It is our desire to place on record the report of a case of multiple retinal hemorrhages which apparently falls into the idiopathic group and which appears to have shown improvement under vitamin K therapy. The object in reporting the case is to stimulate interest in the treatment of retinal hemorrhages since the present methods of treatment seem deficient in many respects.

Case Report

Mr. A. E., fifty-one years of age, a railroad employe, was first seen on April 29, 1938. He stated that one year previously he had noted blurring of vision in the left eye, together with slight ocular pain. He consulted an oculist, who prescribed a change of lenses and advised removal of some infected teeth. The condition persisted although the glasses were subsequently changed in October, 1937. The vision continued to fail progressively in the left eye and the right eye became involved to a lesser degree in April, 1938.

On April 29, 1938, examination of the eyes revealed them to be normal externally with normal pupillary reactions and extraocular movements. The intraocular tension measured 17 mm. of Hg. in the right eye and 13 mm. of Hg. in the left eye. Without glasses vision was 20/50+2 in the right eye and 2/200 in the left eye. Lenses improved the visual acuity in the right eye to 20/25—2, but vision in the left eye could not be improved by lenses. Ophthalmoscopic examination of the right eye showed the nerve head to be of normal color with well defined neuro-retinal margins and normal physiological cupping. There was slight edema of the macular region and scattered throughout the fundus were a few grayish white areas, which were interpreted to be the relics of previous hemorrhages. A few superficial hemorrhages were noted in the right fundus at this time. The blood vessels appeared to be free from arteriosclerotic changes. In the right eye the disc was normal. The macular region was edematous and definitely elevated. There was a fresh superficial hemorrhage along the inferior temporal vein and also a few scattered hemorrhages throughout the fundus. There were also several grayish white areas similar to those seen in the right eye. The blood vessels showed no arteriosclerotic changes. Hospitalization for study and treatment was advised and on May 4, 1938, the patient entered the Miller Hospital, St. Paul, Minnesota.

On admission the temperature was 98.6, the pulse was 70 and the respirations were 18. The blood pressure was 156/90. The patient's family and past history revealed nothing of importance except that in November, 1937, three infected teeth had been extracted. The inventory by systems failed to elicit any points which had a bearing upon the patient's ocular difficulties. A physical examination was completely negative except for the eye findings, no foci of infection being found in the mouth, sinuses or tonsils.

The laboratory findings were as follows: Red blood cells 4,500,000; Hgb. 80 per cent; white blood cells 7,800. Differential formula: neutrophils 59%; lymphocytes 36%; basophils 1%; eosinophils 2%.

The blood smear showed the red blood cells to be normal in appearance.

The bleeding time was three minutes.

The coagulation time was four minutes.

Urinalysis showed the urine to be alkaline with a specific gravity of 1.019. There was no sugar or albumin present and the microscopic examination was essentially normal.

The Kolmer and Kahn tests were negative.

The Mantoux test was negative.

The excretion of P.S.P. was 60 per cent at the end of two hours.

The blood urea was 19 mgms. per cent.

The patient was put on a regime of calcium gluconate drams I t.i.d. during his stay in the hospital. During the brief period of hospitalization his eyes remained unchanged, and he was discharged on May 6, 1938, to be followed on the outside. Upon leaving the hospital he was advised to continue the calcium therapy and to take pilocarpine sweats at home under the direction of his family doctor.

He was next examined on May 14 and on this visit the fundi appeared unchanged.

On May 27 he was re-examined and the fundi showed no new changes. Vision in the left eye was recorded as ability to count fingers at 2 feet.

It was decided on June 29 to institute treatment with vitamin K and the patient was given a supply of the vitamin and instructed to take one teaspoonful three times a day.

On July 20 the hemorrhages appeared to be absorbing and there were no fresh hemorrhages.

On August 31 the fundi were examined and with the hemorrhages were found to be completely absorbed, with the exception of one small paramacular hemorrhage in the left eye which did not appear to be recent. There were scattered areas of hyaline degeneration throughout both fundi which had resulted from previous hemorrhages and there was moderate edema of the left macular region.

The patient was told to continue with the vitamin K therapy and to return in two months. He reported on November 8 and stated that vision in the left eye was improved. Examination with the binocular ophthalmoscope revealed a picture very similar to that described on the previous examination. The right fundus was free from hemorrhages. In the left eye there was a very small faint layer of preretinal blood inferior and temporal to the left macula. There were numerous, scattered, grayish white hyaline-appearing areas in each fundus but no pigment disturbance. Vision with glasses was recorded as 20/30 in the right eye and 14/200 in the left eye.

Comment

Although one is never warranted in drawing conclusions from a single case, it is felt that the patient may possibly have been benefited by the administration of vitamin K. When first seen there was ophthalmoscopic evidence to indicate that in addition to the retinal hemorrhages of recent origin the patient must have at some previous date been subject to bleeding into the superficial layers of the retina. Careful clinical and laboratory examination did not elicit any of the usual causes for the hemorrhagic diathesis. On a regime of calcium therapy, the retinal picture remained essentially unchanged. The improvement which attended the administration of vitamin K was both prompt and striking, and over a five-month period no new hemorrhages have made their appearance. The dosage of 5 c.c. three times a day of vitamin K was purely empirical and further investigation may show that this is neither the optimal nor most efficient dosage to prevent hemorrhages. The authors, actuated by the striking results in this single case, have attempted to treat the hemorrhages of diabetic retinitis along similar lines. To date the few cases which have received this form of treatment appear to have derived little or no benefit from vitamin K therapy. All of the patients so treated were elderly diabetics and all showed marked vascular change in the retinal vessels.

It is hoped that by instituting treatment at an earlier stage in younger individuals whose retinal arterioles are free from organic change that some of the untoward results of retinal hemorrhage may be obviated.

In conclusion, the authors desire to express their appreciation to Mr. James Moore of the Archer-Daniels-Midland Corporation, who made it possible for them to obtain the vitamin K. This particular preparation is an oil extract of hemp which has been tested on chicks for its content of antihemorrhagic factor.

References

1. Dam, H.: The anti-hemorrhagic vitamin of the chick; occurrence and chemical nature. Nature, 135:652-653, (April 27) 1935.
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ALCOHOL IN RELATION TO TRAFFIC ACCIDENTS

Richard L. Holcomb, Evanston, Ill. (*Journal A.M.A.*, Sept. 17, 1938), reports the results of a study of the drinking of drivers involved in personal injury accidents and of the drinking of drivers in the general population. The second study served as a control of the first, allowing conclusions to be drawn as to the part alcohol plays in accidents. A total of 270 persons were tested in the first study. Drivers involved in personal injury accidents who accompanied the persons injured to a hospital or drivers who themselves were injured were tested by urinalysis for alcohol. A total of 1,750 persons were tested in the second study. Drivers were chosen at random from an area comparable to that of the first study. A complete testing laboratory, with the Harger "drunkometer," was set up in a trailer, allowing breath tests for alcohol to be made immediately. 1. The highest percentage of drinking drivers occurs in the early morning hours and over the week-end. 2. The largest number of drinking drivers occurs in the early evening and over the week-end. 3. The peak age for drinking drivers is from 25 to 30. 4. Women drink and drive as much as men when the number of women driving at various hours of the day is considered. 5. The percentage of drinking drivers in the general population varies as does the percentage of drinking drivers in the personal injury accident group but falls considerably lower at all times. 6. The percentage or number of drivers involved in personal injury accidents varies as does the percentage or number of drinking drivers. 7. As the blood alcohol content increases, the number of drivers appearing in the personay injury accident group increases out of all proportion over that in the general driving population. 8. As alcohol increases, accidents increase and at a rate somewhat proportionate to the increase in alcohol. 9. Equal percentages of drinking drivers are found in the accident group and in the general population group at a point near 0.5 part of alcohol per thousand parts of blood, indicating that alcohol in that amount is not necessarily a significant cause of accidents. 10. The data gathered in this study confirms a self-evident fact, that alcohol is a major cause of automobile accidents.

George A. Earl, M.D., *President*
Minnesota State Medical Association

President's Letter

The year 1939 is before us.

We start out, as a medical association, from a splendid vantage point. We have a fine heritage and our scientific standing is unquestioned. This applies not only to our famous personalities, but to the average level of our practitioners. From the standpoint of laws to protect the public health none are more fortunate than we.

We can do no better in the future than to follow the examples of the past. Thus we must stress, first, our mission as practitioners of medicine. We must show that our primary interest is scientific attainment and that we cherish, above all, our close personal patient-doctor relationship together with free choice of physician except for certain unavoidable and natural limitations, and hope to continue it.

Keeping in mind, then, our primary interest as practitioners we are going to begin this year a trial of what has come to be known as the "Indiana Plan." This trial was suggested by our retiring past president, Dr. Adson, and endorsed by my predecessor, Dr. Hayes, and by the Council. According to this plan, one topic, or related group of topics, is to be stressed each month in our public health relations. Dr. O'Brien will discuss it over the radio, it will be emphasized in our regular press releases and in public talks before lay groups.

The subject is to be of seasonal interest if possible, with Pneumonia selected for this first month of January. Coöperation of MINNESOTA MEDICINE and of our societies and membership in general has been enlisted in carrying out this plan. Insofar as it does not interfere with previously arranged programs, county societies will be asked to include a paper on the subject at their regular meetings.

In addition to our scientific pursuits and related public health contacts, we are obliged, these days, to give our attention to Socialized Medicine, so-called. Probably the term "Government Medicine" is more exact since in the minds of many people "Socialized Medicine" refers also to voluntary efforts along insurance lines and not under government control.

The question of Government Medicine is undoubtedly in the foreground of public consciousness. Scarcely a lay magazine feels its pages are complete without an article on it. It is for this reason that an Institute on Socialized Medicine has been proposed. The objective of this institute would be to provide our members with a general review of the effects of government in the care of the sick, both as we know it in this country and as it has been observed in Europe. Besides this presentation of facts, we hope to have an analysis of methods of presentation.

We are happy to announce that we have secured Mr. J. G. Crownhart, Executive Secretary of the State Medical Society of Wisconsin, to give us the facts about government medicine in Europe. Those of us who heard Mr. Crownhart give an address in Duluth recently can vouch for it that his talk alone will be worth the trip to the Institute. Dr. W. A. O'Brien and others will participate in discussions. Every member is invited to attend. The date and place is January 14, 2:30 p. m. at the Saint Paul Hotel Ballroom, Saint Paul, Minnesota.

GEORGE EARL, M.D., *President*
Minnesota State Medical Association.

HISTORY OF MEDICINE IN RAMSEY COUNTY

BY J. M. ARMSTRONG, M.D.

(Continued from December issue)

1854

In the library of the Minnesota State Historical Society is a small octavo pamphlet of eight pages called the *Minnesota Homeopath,* Vol. I, No. 4, January, 1859, published by George Hadfield. It, no doubt, was our first medical journal, if it can so be considered. It contains an article on homeopathy, testimonials, and advertisements of Dr. Hadfield's medicines. No other copy appears to be known and no reference to it is to be found in the Index Catalogue of the Surgeon General's Library. Hadfield's office at that time was on Fourth Street just below the Seven Corners where the Arlington Hotel now is. He left, it is said, about 1860 for Memphis, went thence to Little Rock and after the war to Chicago. In 1869, he settled in Cincinnati and exploited a machine for equalizing the circulation of the blood. No further history of him has come to the notice of the writer. He was a man of no culture and a poor physician.

Three physicians not previously mentioned came to St. Paul in 1854 and remained but a short time, Dr. W. W. Mayo, later of Rochester, Dr. Percival Barton, and Dr. John Lambert, of Saco, Maine. Possibly, the latter did not come till the following year. He was still in St. Paul in September, 1855, as an infant daughter of his died there on September 5, 1855. Dr. Barton remained but a short time and then moved to a farm at Inver Grove, Dakota County. More will be heard of him later. On February 2, 1854, Dr. L. C. Kinney received from the county commissioners the sum of one hundred dollars for the care of some smallpox patients. In the fall, Dr. Frederick Andros moved down from Long Prairie, having been elected to the Legislature. He left for Iowa after the legislative session the following spring.

1855

The year 1855 in St. Paul was an eventful one as far as the medical profession was concerned, as some of the men who later became prominent in the profession arrived during that year. There were some changes in the drug business: Dr. Kinney sold his store to Dr. Morton and Thomas E. Pace, the latter having been Dr. Kinney's clerk. Kinney opened a livery stable, and Wolf and Steever opened the Central Drug Store on Third and Wabasha Streets.

The papers for June 26 state that St. Joseph's Hospital had been opened but a short time, and that ten persons were being cared for there, none of whom was a charity patient. The Christ Church Orphans Home and Hospital was incorporated in March. This organization became the nucleus of what was later to be St. Luke's Hospital. The building it occupied still stands at Nos. 87 and 89 Park Place. On account of the muddy roads in the spring the stage coach overturned while conveying passengers between St. Paul and St. Anthony, and a

Mr. Scott and a Mr. Hoyt of St. Paul were injured. Scott suffered a broken leg and Hoyt's head was cut. They were cared for by Dr. Murphy. At the meeting of the county commissioners on April 16, Dr. Goodrich was allowed a quarter salarly of $200 as health officer, and A. M. Fridly, the sheriff, presented a bill for $500 for boarding, and hanging the Indian Utrazy (variously spelled) who had committed a murder in the city. Dr. Willey presented a bill for $50 for medical services rendered to the same Indian. After due consideration the county commissioners cut the sheriff's bill to $225, and allowed Dr. Willey $30. Inasmuch as the latter's services were pronouncing the man dead, after the sheriff had hanged him, the amount was deemed sufficient. According to eye witnesses of this hanging it was quite a gala event. No gallows were erected and the public, if not invited, was present in large numbers. The man was hanged to the limb of an oak tree that grew where the St. Paul Catholic Orphan Asylum now stands (933 Carroll Avenue), at that time quite a long way from town. Shortly after this event, Willey was appointed city physician by the Board of Health, and Dr. David Day returned from Philadelphia, where he had gone to receive his diploma from the University of Pennsylvania.

There was considerable guarded news about cholera in the papers during the summer, and editorials appeared denying that any St. Paul residents had suffered from the disease. Six new physicians came to St. Paul this year. Franklin R. Smith, whose card appeared in the paper under date of November 21, occupied the residence which had recently been vacated by Dr. Biddle. He gave Ex-Governor Ramsey and Hon. David Cooper as references. On December 1 the cards of Drs. John V. Wren and Jacob Henry Stewart appeared in the papers, together with the announcement of St. Paul's first out-and-out medical quack, Russell Post. Notices of these men appear elsewhere in this sketch. The year 1855 also saw the arrival of Drs. J. C. Merrill, Gustavus Rosenk, John B. Phillips, Rudolph Alberti, and James Dorsey. Dr. A. P. Marsh, who at one time had his office with Dr. Goodrich, and played a small part in the organization of the Minnesota Medical Society, moved from St. Paul, probably to Philadelphia. It was surmised by some that his diploma was stolen or forged. Merrill was a homeopath who later called himself Professor Merrill. He played no part in our medical history. He died in St. Paul. The late Dr. Merrill of Stillwater was his son. Alberti, who was somewhat of a mystery, was either a German Jew or a Pole. Berthier was a French Canadian who remained some years and then went to France or Canada. Alberti, Berthier, and Rosenk were not considered by the regular profession to be reputable practitioners. However, they are of sufficient interest to warrant a brief mention of them. As to Dorsey, no more appears to be known than that he came to St. Paul and inserted his card in the paper. A Dr. James Dorsey received the M.D. degree from the University of Maryland in 1825. Whether or not he is the same man is not known. He probably moved on to a better location. Dr. Phillips was a man of education and culture, but he practiced little or not at all in St. Paul. Most of the other men, with the exception of Rosenk and Post, lived only a short time in the city. The two last named remained for a number of years. Their announcements, therefore, may be quoted in full.

Dr. Post

> Pearl Street, South Side, 2nd door west, Baldwin School, St. Paul, would offer his professional services to the public, for the cure of all Chronic Diseases. Examinations made and full descriptions given without previous knowledge of the case or asking any questions.
>
> Practice—Electric and Electro-Magnetism

Dr. G. Rosenk

German Practical Physician

> Formerly teacher at the Midwife Academy and District's Physician recommends himself in Surgery, Midwifery, and Dentistry and will cure all external and internal diseases of male as well as female persons so as to let them have a cheaper medical attendance, and will do midwifery to poor women without charge.

1856

Late in the year the first published directory in book form for St. Paul appeared. The classified list of physicians together with the location of their offices is as follows:

Alberti, R., St. Anthony St., corner of Wabashaw.
Berthier, Alfred, Seventh St., near Rosabel.
Bunting, J. C., St. Anthony St., Opp. Presbyterian Church.
Dewey, J. J., St. Paul St., below Somerset.
Goodrich, J. D., Third St., below Robert; house, Fifth St., between Jackson and Robert.
Hadfield, George, Third above Minnesota.
Merrill, J. C., St. Anthony St., above Presbyterian Church.
Miller, W. H. (German), St. Anthony St.
Morton, W. H., Third St., near Robert.
Patterson, M.D., Phoenix Block near Post Office.
Potts, T. R., Robert St. between Fifth and Sixth.
Rosenk, Gustavus, St. Anthony St. near Hill.
Smith, F. R., Main St. near Market.
Stewart, J. H., Phoenix Block near Post Office.
Steele, John, Tenth cor. Cooper.
Wren, J. V., Fort near Snelling House.
Veiden, T. J., Third between Robert and Minnesota.
Willey, Samuel, St. Anthony below American House.

Dr. Brisbine's name appears in the body of the directory but was left out of the classified list. The omission may perhaps be explained by the fact that Brisbine was abroad during the year. It will be seen that the list numbers eighteen names. Kellogg Boulevard above Wabasha was then called St. Anthony Street. Olive Street was then St. Paul Street. Fourth Street above Wabasha was then called Main. The Post Office was on Third Street between Washington and Market, and the Presbyterian Church, on Third and St. Peter, stood on the site now occupied by the Women's City Club. The Phoenix Block was on Third Street near Washington on the south side. West Seventh was then known as Fort Street.

Five new names of physicians appear on this list: Drs. Bunting, Patterson, Steele, Smith and Wren. Bunting came from Philadelphia. He was a brother-in-law of Wolff, the druggist, and died of tuberculosis. Wren was in St. Paul several years. He had been a preacher, it is said, before he was a physician, and he paid more attention to politics than to medicine. He was city physician in 1857-1858 and coroner in 1858-60. During the years 1862-1864 he served in the army and was stationed at Fort Ripley. His portrait may be seen with that of the other city officials of 1857-1858, in the County Auditor's office in the Court House. Patterson was an M.B. by baptism and a dentist by profession. John Steele arrived in the summer of 1855 from Strasburg, Pennsylvania. He was a brother of Franklin Steele and practiced in St. Paul for twenty-eight years before retiring. He died in 1885. Like many of our early physicians he came because of his health. Dr. John Steele Abbott is his grandson. Dr. John A. Vervais also came to St. Paul this same year. Other than being mentioned as on the staff of St. Joseph's Hospital in 1859 and as city physician, he does not appear to have been very active in a medical way. For the most part the French Canadians kept to themselves and mixed but little with the rest of the population. The biographies of Franklin R. Smith and of a Dr. W. S. Cox who came to St. Paul this year will appear later.

Two other medical men not previously mentioned who were destined to play a prominent part in the future history of medicine in Minnesota, came to St. Paul in 1856. They were classmates at the University of Pennsylvania and arrived on the same steamboat. Both passed the remainder of their lives in St. Paul, and both became president of the Ramsey County Medical Society. They were Drs. Alfred Wharton and Daniel W. Hand. Wharton was a tall aristocratic man, correct in dress, manners, and deportment, quick of perception, very able professionally. Hand was shorter, rather a plodder, and a hard worker. He was interested wholly in his profession and anxious to keep in touch with every new development in the science of medicine. Wharton had money, while Hand had none. Wharton made money both in his profession and out of it. Hand finally accumulated money in his profession but worked very hard for it. Hand did everything that was thrust upon him which was for the good of the profession or for the public. He gave much of his time to teaching, to serving as a member of the State Board of Health and the State Board of Medical Examiners, and to other duties which brought him little, if any, financial return. Wharton shirked no responsibility but sought none. He retired from practice in 1885, living until 1920 and looking twenty years younger than his age until shortly before his death. Hand aged rapidly, became very deaf, and practiced till the last.

Dr. Wharton related to the writer the following incident which occurred one Sunday afternoon shortly after the two men arrived in St. Paul. They went for a walk toward the outskirts of the city, and Hand remarked that he wished he had brought along a skull from Pennsylvania. He had not been able to find room for one in his baggage. After walking for a time they reached a spot near the present corner of College Avenue and St. Peter Street, then the northern boundary of the city. There was a spring there, and that with a heavy rain had washed out a gully in the side of the hill and exposed a coffin. They went back after dark and Hand got the skull. In later times when the houses on the east side of St. Peter Street were built, other coffins were found. This was the site of the Catholic Cemetery from 1849 to 1854 (bounded by Summit, Wabasha, College, and St. Peter). Previous to this time the cemetery was on Bench Street north of the old log chapel of St. Paul from which the city takes its name. Skeletons were dug up on this latter site also in later times when the Stees block and the present *Dispatch-Pioneer Press* building were erected. When the present Federal Farm Loan Bank building was built (about 1911) a skeleton was unearthed under the sidewalk on the north side of Fourth Street. The workmen left it there. The present Calvary Cemetery was preceded by another one on the site now occupied by St. Joseph's Academy and northward. When the writer was a boy, he saw some skeletons unearthed during the installation of either sewer or water pipes on Iglehart Street between Farrington and Western Avenues. In the autumn of 1930 when an addition was being built to the Academy building, some coffins were unearthed during the excavation for the foundation.

Another medical man came to St. Paul during this year, who, though he never practiced medicine, was a man of charming manners and was well known to the early settlers. He had practiced or attempted to practice in Chicago, but became associated upon his arrival here with the Zimmerman photographic galleries and made his living painting miniatures, one of which, to the writer's knowledge, is very well done. He died in St. Paul about 1882. He was a graduate of the University of Copenhagen in 1850. A pair of obstetrical forceps in a buckskin bag and some woolen obstetrical tape which belonged to him, also some of his manuscript lecture notes, are in the museum of the Ramsey County Medical Society. The forceps are, without doubt, one of the most beautiful examples of polished, hand forged steel ever seen. His name was A. Falkinschield.

1857

This was the year of the financial panic. For three years there had been an unbridled speculation in real estate, and land had been in such a demand that investors, buying and selling on a rising market, were able to make a profit, even though they must borrow money at three per cent or more per month. Every boat coming up the river brought in scores of immigrants, speculators, and many others looking for easy money. St. Paul was known as the liveliest and toughest town on the river, a place where thefts and even murders were common.

In 1857, the bubble burst. Hard money disappeared and currency issued by banks became worthless, since its value was based upon speculative land values. Even money issued by the county, the city, and the state, was valued at only forty cents on the dollar. The entire population was affected. To keep people from starvation, the city projected public improvements, paying for the labor in scrip. In the meantime a vigilance committee was organized, and the rowdy element was forced to leave town. Notwithstanding these hard times, three new physicians came to town. The card of Dr. H. Wedelstaedt, homeopathist, appeared in the *Pioneer* and *Democrat* on November 15. He gave Dr. Hadfield and Dr. Pulto of Cincinnati as references. He remained in St. Paul the rest of his life and was very well known there. Dr. Sylvester J. Sawyer inserted his card in the paper of October 15. He stated that he was "late Surgeon to Bellview Hospital, New York City." He left a year or so before the Civil war. While in St. Paul he married Helen Hastings, halfbreed daughter of one of the early settlers. Dr. J. H. Studdeford's card appeared in the paper on October 16. He claimed to be late house surgeon to the Blackwell's Island Hospital, New York. Apparently he remained but a few months as no other information about him is available. In April, 1857, Samuel Medary arrived. He had been appointed Territorial Governor of Minnesota. With him as his secretary came Dr. Thomas Edwin Massey of Columbus, Ohio.

Massey had formerly been a resident of Hot Springs, Virginia, and had graduated from the University of Pennsylvania in 1846. For some years prior to his arrival in Minnesota he divided his attention between medicine and journalism, and became the editor of the *Ohio Statesman*. An article written by him on the subject of the inflammation of the female genital organs was published in the first number of the *Ohio Medical and Surgical Journal* (September, 1848). During his period of residence in St. Paul his practice of medicine was subordinated to other interests. In January, 1862, he started a newspaper called the *St. Paul Journal* (weekly), but the paper did not flourish, due to the fact that its political affiliations were with the anti-war Democrats, and publication was suspended at the end of eight months. Dr. Massey presented an early form of stethoscope to Dr. C. E. Smith, Sr. It closely approaches in design the original wooden stethoscope pictured in the second edition of Laennec. Massey lived in St. Paul until about 1863, when he returned to Ohio. Of his later activities little is known. He moved during the following decade to Colorado, where he probably continued his interest in journalism and in medicine. In 1874, he published in Denver a small pamphlet entitled the "Relations of Colorado to Pulmonary Consumption." The following year an article by him appeared in the Transactions of the Colorado Territorial Medical Society. The paper was one which he had read before the society in 1873. It is stated that he went from Colorado to Washington (state?).

(To be continued in February issue.)

EDITORIAL

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BUSINESS MANAGER
J. R. Bruce

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EXTENSION OF GOVERNMENT MEDICAL ACTIVITIES

THE present Congress is doubtless going to be called upon to appropriate huge sums for increasing government health activities on a national scale. Although the Interdepartmental Committee in its report last July favored compulsory sickness insurance as a government activity but did not recommend it at the time presumably on account of the billions of dollars involved, the committee did approve legislation to extend in various ways government health activities, which it is estimated will amount to 485 million dollars a year.

The medical profession as a whole sees no need for expenditures on such a scale, and its members as citizens and taxpayers know that the federal government with an annual deficit of several billions of dollars could not afford such appropriations if they were needed. This attitude may seem inconceivable to the theorists who are directing government activities in Washington with a total disregard for adjusting expenditures and income.

If the medical profession of this country is convinced that the extension of government in medical activities leading more and more towards state medicine resembling that established in Europe is undesirable, it should take a militant stand on these proposals as they appear in Congress by letting representatives know, in no uncertain terms, its convictions.

And, if any physician has no convictions as to the comparative values of medical care as furnished by so-called private practice as typified by medical practice in this country, and medical care as furnished by government sickness insurance in Europe, let him read the report* by the secretary of the Wisconsin State Medical Association of the operation of state medicine in England, France, Germany, Denmark, Norway, and Sweden.

A student of social problems, and particularly those associated with medical practice, Crownhart was well prepared to undertake this investigation. Convinced that conflicting reports of the operation of sickness insurance in Europe can be explained on the basis of restricted viewpoint, Crownhart studied the systems in the countries mentioned from the standpoint of the insurance administrators, the labor organizations, the farmers, the hospitals, the physicians and the insured individuals. The picture he paints is of a medical service falling far short of the goal aimed at by the proponents of socialized medicine, limited in its social service by inadequate insurance funds and necessitating a huge administrative personnel. Inseparably associated with compensation for loss of wages, the sums involved are enormous.

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*Crownhart, J. G.: Sickness insurance in Europe. Price, $1.00. State Medical Society of Wisconsin, Madison, Wisconsin.

The question of the enactment of legislation approaching state medicine is a live one. Proponents of change in medical practice are most energetic. The article entitled "A.M.A." in the November *Fortune* was doubtless written largely in a provocative mood. The one entitled "Rehearsal for State Medicine" in the *Saturday Evening Post* for December 17 is an illustration of how medical practice can be changed by a governmental agency when someone in authority thinks there is need.

What should the attitude of the medical profession be? Certainly we should voice our conviction that panel system medicine is inferior medical care. The emergency care provided for 77,000 Farm Security Administration clients in North and South Dakota and elsewhere may be necessary to maintain medical care in localities unable to support doctors, but such a system is supported by taxpayers elsewhere and is not therefore generally applicable.

It must be remembered that proposals to apply a changed system of medicine to those with an income of $1,500 a year or less, is going to affect 90 per cent of the population and those with $3,000 a year or less some 97 per cent.

As Crownhart concludes, each state must study its own medical needs and decide whether the sickness insurance in Europe which falls far short of ideal medical care, is wanted.

The real need for financial assistance in meeting the cost of sickness is not for the payment of an occasional visit from the general practitioner. Although the total of this item is a large sum it is so widely spread that it does not present a hardship to the individual patient. The item that requires the financial assistance readily furnished by insurance, is the cost of an acute illness requiring in most instances hospital care and services of specialists and nurses or of a prolonged illness involving loss of income. The hospital associations are meeting part of this liability by insurance methods and there is reason to believe that cash indemnity or similar policies issued by commercial insurance companies or by non-profit mutual organizations, can meet such a need on a much larger scale than they do at present. We shall watch with interest the working out of experiments along this line recently inaugurated in California and Wisconsin. The response of the public to insurance against hospital bills, suggests the likelihood of a similar reception of insurance against other costs incidental to hospitalization.

It is difficult for the average layman to grasp the facts here brought out. It would be well for members of the profession to explain to their patients that it is to the advantage of public and profession to avoid extension of medical service supplied by government agencies. Our representatives in Washington wish to know what their constituents think on the subject.

THE MEGAKARYOCYTE

SYMMERS[5] has recently reiterated a statement he articled first in 1917,[6] bearing upon the relationship of Hodgkins' disease with the megakaryocytes of the bone marrow. W. B. Castle[1] lecturing before the Victorian Branch of the British Medical Society in Australia is reported in the letter to the A.M.A. as stating "Hodgkins disease is a megakaryocyte Tumor."

This is a challenging statement. Medlar[3] appears to have had the same concept and called Hodgkins a metastasizing tumor—a "megakaryocytoblastoma." Bunting and Minot both discovered megakaryocytes in the small blood vessels of lymph glands in patients with Hodgkins disease. This is a field in which opinions have arisen chiefly through cytological study and morphological resemblance. All observers must agree that they are looking at cells more or less distorted in processing and staining. At the same time the method has been highly productive and has greatly advanced knowledge. Nevertheless the megakaryocyte (and their exclusive marrow origin seems to be accepted) has not been as easy to study as early erythropoietic or leukopoietic forms.

We should recall that the thrombocyte is a sticky blood traveler and it is his business to agglomerate where exposures occur and barriers are broken—hence the "white clot." The parent megakaryocytes are likewise subject to easy distortion. Liniarzi[2] and his associates at the University of Illinois have recently offered a technic to obviate some of this distortion. The needled sternal marrow is handled in paraffine lined tubes and pipettes and centrifuged at high speed to send the adult red cells to the bottom of the Wintrobe tube and leave the serum and early leukocyte and platelet precursors juxtaposed in the midportion. From a mixture of these, smears are made of surpassing excellence. Ponderous systems on hematology have not given much satisfaction to the clinician already weighed down by the burden of voluminous terminology and endless repetition. Neither do we profit especially by reference to encyclopedic summaries that aim to leave out mention of no one in any land who ever ventured to express an opinion or submit an observation.

It is necessary to have accurate data concerning the thrombocytes in all essential and secondary depression of the megakaryocyte sequence. Otherwise, splenectomy will be ventured where entirely contraindicated as, for example, in toxic purpura, concealed poisoning, or even in aleukemic leukosis. Rhoads and Miller[4] have recently published data on four different groups of marrow in so-called "aplastic anemia." All were anemic but the marrow varied from true aplasia through grades of hyperplasia with retention of marrow products, and group 4 which is a megakaryocytic replacement of other elements and is comparable to the anemia of the leukoses. Hodgkins continues to be a great puzzle; but whether megakaryocyte studies shall help to advance its therapy or not, there is a wealth of clinical interest centered in the factor of physiologic repression exerted upon the bone marrow by the spleen. This is best exemplified in essential thrombocytopenia where splenectomy cures.

Limarzo's technic promises to give diagnostic assurance in this field as well as in the dubious and uncertain "aplastics" where diagnoses are beset with many pitfalls and uncertainties.

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PNEUMONIA IN MINNESOTA

THE selection of pneumonia as the subject for emphasis in the month of January is particularly timely, for it is in the winter months that pneumonia is most prevalent in Minnesota. Although pneumonia in Minnesota is not as prevalent nor as serious a disease as in certain other states, we do lose from 1,600 to 2,600 citizens yearly from pneumonia of all forms. We have probably three or four times as many cases as this in the state each year and this winter promises to have an increase over recent years.

About half the reported deaths from pneumonia are lobar in type. Inasmuch as it has come to be more generally recognized that an appreciable percentage of broncho-pneumonia is caused by the pneumococcus, several thousand individuals in the state each year are potential candidates for pneumonia serum.

Minnesota has joined several of the eastern states, notably New York and Massachusetts, in a campaign to fight pneumonia. Two years ago facilities were first offered by the State Board of Health for typing the pneumococci and limited amounts of anti-pneumococcic serum for Types I and II were made available to those unable to afford this valuable adjunct in the treatment of the disease.

The value of specific serum in the treatment of the corresponding types of pneumococcic pneumonia having been well established, it behooves every physician likely to be called to see a patient suffering from this disease to be prepared to take advantage of the oppoutunities for typing and the procuring of free serum, if the patient cannot afford it.

If a sputum outfit put out by the State Board of Health is not available, a small but wide necked bottle may be used to collect the sputum, which must be that coughed up from the bronchial tubes and should be at least 5 c.c. in amount. In the case of children, when sputum so often cannot be raised, the child should be placed with the affected side up and induced to cough by tickling the pharynx with a sterile swab from a diphtheria culture outfit and the raised sputum colected from the throat by means of the swab. In order to keep the swab moist during transit, the swab is then pushed into the medium in the diptheria culture tube, not simply rubbed on the surface of the medium.

The sputum specimen is then mailed or sent (whichever is quicker) to:

Main Laboratories, Division of Preventable Diseases,
University Campus, Minneapolis, Minnesota
Duluth and St. Louis County Branch Laboratory
228 New Jersey Building, Duluth, Minnesota
Rural Health District No. 1
City Hall, Bemidji, Minnesota
Rural Health District No. 2
Court House, Mankato, Minnesota
Rural Health District No. 3
City Hall, Rochester, Minnesota

A telephonic or telegraphic report will be sent by the laboratory as soon as possible if typing is successful and therapeutic serum is available, or if time permits the submission of another specimen.

The various laboratories may be reached after hours or on Sundays and holidays as follows:

Main Laboratories, University Campus—Call University of Minnesota telephone operator and ask for Pneumonia Typing Service.
Branch Laboratory, Duluth—Call Hemlock 907 or Hemlock 5040-W.
Health District No. 1, Bemidji—Call District Health Officer.
Health District No. 2, Mankato—Call District Health Officer.
Health District No. 3, Rochester—Call District Health Officer.

Although the funds available for the purchase of serum are limited, as long as it lasts type sera other than types I and II will be furnished direct from the Main Laboratories, Division of Preventable Diseases, State Department of Health, University Campus, Minneapolis, as follows: III, IV, V, VI, VII, VIII, XII, XIV, XVII, XVIII, XIX, XXVIII and XXIX. In addition type sera XIII, XV and XVI will be secured air mail by Main Laboratories when typing is carried out early enough to obtain the serum in time for use. Serum thus ordered should reach Minneapolis inside of twenty-four hours.

It is generally conceded that after four days have elapsed from the onset of symptoms of pneumonia, serum is not likely to be of benefit. Fast action is therefore essential.

As valuable articles on the subject of pneumonia in Minnesota, we recommend those by Drs. Heathman, McDaniel and Chesley which appeared in this journal for January and December, 1937. An authoritative booklet on serum treatment is one entitled "Pneumonia and Serum Therapy" by Frederick T. Lord and Roderick Heffron, published by the Commonwealth Fund, New York.

Reminding You
HAVE YOU
PAID
FOR YOUR
CHRISTMAS
SEALS

In Memoriam

Gustave Adolph Christensen

1864-1938

Dr. Gustave Adolph Christensen, a pioneer physician at Cass Lake, died at his home October 9, 1938, at the age of seventy-four. He had practiced in Cass Lake since 1901 when he left Granite Falls.

Dr. Christensen was born in Chicago on March 2, 1864, the son of Rev. Emil and Amelia Christensen, pioneer missionaries who established the first Lutheran mission post in Oregon. He was sent to boarding school and received his medical education in Indianapolis, Indiana. In 1888 he was married to Delia Thykeson of Albert Lea, Minnesota, and from this union seven children were born, five of whom survive.

Records fail to show what medical school was attended by Dr. Christensen. He was never a member of the Minnesota State Medical Association.

Frederick A. Stevens

1860-1938

Dr. Frederick A. Stevens, a resident of Lake Elmo for more than fifty years, died during the night of November 28, 1938, at the age of seventy-eight.

Frederick Stevens was born October 28, 1860, at Mantorville, Minnesota, the son of Edwin A. Stevens who was at one time a member of the editorial staff of the *Pioneer Press,* Saint Paul. Dr. Stevens graduated from the Central High school in Saint Paul. After finishing sophomore year at the University of Minnesota, he graduated from the Hahnemann Medical College, Chicago, in 1883, and the same year was licensed in Minnesota.

After spending two years doing postgraduate work at the New York Ophthalmic Institute, the College of Physicians and at the Bellevue Hospital, Dr. Stevens located at Lake Elmo in 1887. His early surgical work was done in homes in or close to Lake Elmo until the Lake Elmo Sanatorium was built. When this proved too small, he transferred his patients to Bethesda Hospital in Saint Paul.

Dr. Stevens joined the Ramsey County Medical Society September 29, 1913, and was a member of the Minnesota State and American Medical Associations. He was married January 14, 1914, to Gertrude Londigan, who with their daughters, Kathryn, Gertrude and Marian, survive.

Dr. Stevens was a hard worker, a genial companion, a generous entertainer and had the faculty of endearing himself to his patients who always became and stayed his friends.

He will be greatly missed in the community where he lived and worked so long and for which he did so much.

E. Sydney Boleyn.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
W. F. Braasch, M.D., Chairman

REHEARSAL IN MINNESOTA

In the wake of the widely read *Saturday Evening Post* article entitled "Rehearsal for State Medicine," four officials of the Farm Security Administration presented themselves before the Council of the Minnesota State Medical Association, December 15, in Saint Paul.

These officials confirmed the astonishing extent of various types of medical services for Farm Security Clients described in the article—declared that in each case the plan employed had been worked out by the local county or state medical society—asked the Council to work out some similar plan for care of the farm families of Minnesota who are now receiving loans from the Farm Security Administration.

Problems of Lower Third

Said Spokesman Dr. H. V. Meriwether, United States Public Health Service:

Many farm families in the lower third of farm brackets are in need of medical and dental care.

The Federal Farm Security Administration is trying to rehabilitate these families by loans and by consultation to revise their farming methods and living habits so that they will be able to make a living on their farms and also payments on their loans.

About 80 per cent of these families are making their payments as scheduled. Where they fail we find medical and dental problems in every case. Clearly we cannot continue our program successfully without provision for medical service for these farmers and we have come here today to ask the Minnesota State Medical Association to devise a plan for caring for our families in Minnesota.

Plans Vary

Already there are thirty-two different plans in operation in thirty-two different states. The plans vary because the medical societies, in each case, dictated the plans. In general, there are two different types of arrangement—individual arrangements and "pool," "insurance" or "cash indemnity" plans.

In Ohio, with the individual plan, the list of doctors who wish to participate goes to the farm clients. The client selects his doctor and he and the doctor get together to decide what the client will need for the year. The Farm Security Administration provides the funds.

In Logan County, Ohio, all of the money is put in the hands of the Logan County Medical Society. The custodian of funds for the society pays the doctors' fees according to a prearranged schedule until the money runs out. From then on it is between doctor and patient. The doctor must continue in attendance until the end of the year, however, no matter how the funds hold out.

72 Per Cent of Normal Fees

In the "pool" or common fund plan, the farm client pays a definite sum each year. In the South it is usually $12; in the Northwest $20 to $30. Each client is issued a card with a number and he may call anybody in the medical society to take care of him. The doctor submits his normal fee at the end of the month. If there is enough money to warrant it he is paid 100 per cent of his bill. If not, the amount paid is pro-rated down to whatever the fund can pay. On the average, about 72 per cent of normal fees have been paid in all counties to date. If any money remains after fees are paid, it is held to the end of the year and pro-rated, then, to the doctors.

In County Society Hands

In several counties in Iowa the doctor submits to the county society only an account of services; the county society sets the amount. In any case, the entire matter remains within the county medical society.

And I personally believe that all of these matters should remain in county medical society hands.

Rehabilitating Doctors

North and South Dakota have presented a separate problem. The doctors, as well as the patients, needed rehabilitation if the doctors were to remain in practice there.

The plan in operation was suggested by the doctors. It has been changed three times and the money appropriated has been increased three times.

Last year 92 per cent of the medical bills were paid on a 66 per cent basis for the 67,000 relief load. The question is: shall we shift to a loan instead of a relief basis? Already some 8,000 families are on a loan basis and gradually we may shift entirely to the loan set-up. Payment of medical bills will continue to be on a 66 per cent basis.

The doctors themselves believe they are going to work out something in Dakota that may ultimately be of benefit to all medical societies.

Hospitalization Also

We are working in Dakota toward a group hospitalization plan to take care of all low income families. In Logan county, also, we are making arrangements to take care of hospitalization for our clients on a group hospitalization plan.

We have found in some communities that as many as 38 per cent of adults need restoration of teeth. We are working with the dental societies now, to see how this type of dental work can be done.

For young people we try to provide glasses. For older people we are willing to relinquish a portion of the milk income to permit them to buy glasses.

8,000 in Minnesota

In Minnesota we ask that the state medical association work out the broad plan for care of our Minnesota clients. The county societies can work out the details. There are approximately 8,000 farm families receiving loans from the administration now in this state. About 75 per cent of these families are in the northern part of the state, about 25 per cent in the South. In the North and the West there are from 125 to 150 families in a county. A local superintendent makes investigations for eligibility for loans with the advice of the local banker and others and sets up the individual budget and plan for each family. In most of these cases, the trouble is not lack of income, alone, but lack of proper management of the farm and the home.

Personally, I like the Iowa plan by which the county medical society receives the money, pro-rates it to members and disciplines its own members.

As to Chiselling

The problem of chiselling, so-called, can best be handled so far as the doctors are concerned by their own medical societies. So far as the clients go, we have found that use of the service starts high. Apparently the people want to see if the service is really available as promised. In three months the calls are usually down to normal. In the case of real chisellers the superintendent makes a trip to see the client. It is ordinarily unnecessary for him to call twice.

We suggest that you formulate a plan, first, for the heavy load counties. If the plan works, expand it next year to other counties or change it as you see fit.

* * *

The whole matter was referred for action to the Committee on Low Income and Indigent Problems of which Dr. W. A. Coventry of Duluth is chairman.

Appropriation Endorsed

Dr. A. J. Chesley, secretary and executive officer of the State Department of Health, presented the budget of the Board for 1939, asked the special endorsement of the Council for $20,000 appropriation for purchase of pneumonia serum and also for a $12,000 appropriation for an industrial hygiene program, at the same Council meeting.

He explained that pneumonia serum is now supplied through a special appropriation from the Surgeon General of the United States Public Health Service and will not be available next year.

The Council endorsed the work of the Board in general and particularly its request for these appropriations.

MEDICAL YARDSTICK

There is only one basis for argument in any discussion of methods and payment for medical care. That is: will the resulting service to the patient be in line with the best standards of medical practice?

An excellent yardstick for good medical service has been provided by Mr. J. G. Crownhart, secretary of the Wisconsin State Medical Society, as a result of his own experience in medical organization work in Wisconsin and also of his recent careful survey of medical services in European countries. It is safe to say that any service which could be shown on the basis of experience—not of hopeful thinking—to measure up to this standard could be endorsed by the doctors. The yardstick follows:

Personalized Service

1. Responsibility for the service must be direct to the patient.

2. There must be a recognition of the fact that illness cannot be scheduled and that the physician must have time to do his work.

3. The needs of the individual sick man must govern the service.

4. Service to the patient must be a personalized service.

A fifth stipulation might be added to the effect that the physician must have ample opportunity and incentive for postgraduate study and research.

Obstacles

If it were possible for compulsory government medicine to measure up to this standard in fact, no conscientious physician could object to it. Experience in Europe, familiarity with bureaucracy in America have shown conclusively that systematized government medicine cannot possibly provide a service that measures up to the standard. Even if every government official connected with the service were invariably honest, conscientious and thoroughly qualified for his work, still there would be insuperable physical obstacles in the way that would prevent a personalized service in which the physician had sufficient time to do his work and in which the needs of the sick man alone governed the service.

Some other solution must be found for medical care in the United States.

PUBLIC HEALTH—Dr. Emerson

The following paragraphs from a recent address made in Michigan by Dr. Haven Emerson on "Public Health and Preventive Medicine" are highly pertinent to current discussions of medical care and its possible extensions. Their importance is emphasized by the fact that they come from a public health official and teacher rather than from a typical representative of the private practitioner of medicine.

Says Dr. Emerson:

> Health is much more than the freedom or recovery from disease. It is a way of life, a balance, a compromise, sometimes worth sacrificing other desires or ambitions to achieve, and the most precious possession a person may lose or feel compelled to give up in exchange for other ambitions. Health is a quality of man the individual, not of that amorphous, helpless, blundering social entity, the Public.
>
> There are but six functions which modern civil government has found appropriate and necessary for a department of health. Whatever nation, state, city or rural area has created a department of health to be devoted to the application of the science of preventive medicine for social ends, it has found that vital statistics, communicable disease control, the hygiene of maternity, infancy and childhood, laboratory service, sanitation, and health education include all essential public health services. These are all auxiliary or supplementary activities, the benefit of which comes to the client or patient of the private practitioner.
>
> Each of these funtions of a public health department is necessary to make more effective, not to supplant, the work of the family physician.
>
> For the hygiene of maternity, infancy and the child, if we had a consistently educated community of families, there would be no need for concern of the health officer with such matters.
>
> Certainly no public officer, elected or appointed, can be presumed to have such interest or responsibility for the health of the expectant mother as she herself and her husband should have, and should know enough to ask for from their physician.
>
> It ought to be as much taken for granted to call upon a physician to learn how to keep a baby or its mother well as to ask him to the home to diagnose a fever or set a broken bone.
>
> The health officer of a community is its hired teacher, obliged to advertise to the public the benefits to be expected from using the local practitioner as an expert in normal childhood, as well as calling on him for medicines or operations.
>
> It ought to be the medical practitioners, familiar as they are with the needs for health teaching and service among their patients, who should formulate the substance and sequence of the public educational program, and press upon the health officer to do more and better teaching, and teaching that will bring about personal health of multitudes.—*Journal of the Michigan State Medical Society.*

SAFETY CONFERENCE—DULUTH

Once each year for fifteen years the St. Louis County Medical Society has taken charge of one of the five annual Industrial Conferences staged annually by the Duluth Chamber of Commerce.

Representatives from ninety-seven different industries and business firms attend this conference and the program on industrial medicine arranged by the physicians is a high point in the year's safety program.

Medical head-liner this year was Dr. George Earl, president of the Minnesota State Medical Association, who talked to an audience of 1,000 industrial workers and safety leaders at the Hotel Duluth on the subject "Social Medicine."

> "Dismiss from your minds" Dr. Earl told them, "the idea that the doctors have any prejudice against the state caring for those who cannot care for themselves.
>
> "There is now socialized medicine, if you wish to call it that, to the extent that more hospital beds in the state are maintained by government than are maintained by private sources *but the movement to socialized medical care for all does not spring from democratic sources.* Often it is associated with totalitarian government philosophies as a part of their program to extend administrative power."

CAN A DREAM BECOME A REALITY?

(Monthly Editorial Prepared by the Medical Advisory Committee)

Several years ago three members of our Association sat in a room and pondered their obligations toward the new baby that they had taken upon themselves to nurture and rear, little knowing the immense task, the wellnigh insurmountable difficulties that were before them, but with the hope that as time passed their duties would be made clear to them. These duties have now become a pleasure and a happiness because the dream of yesterday has become a reality of today.

Your Medical Advisory Committee, as the New Year dawns, finds itself working whole heartedly with the insurance companies that protect and indemnify our members. It has an excellent working arrangement with a Committee of the Minnesota State Bar Association. The membership is coming more and more to value the worth of a closeknit, working agreement with each other.

Malpractice litigation is becoming less and less. Biased, unscrupulous, professional testifiers are being eliminated from the picture in lawsuits and a whole-hearted attitude is being assumed by one member toward another in the courts.

A recent experience in Court shows the truth of the statement above. Picture a medical witness testifying before four of his colleagues in a suit involving the work of a member of his profession. In calm, quiet tones the questions are put before him by the defendant's and plaintiff's lawyers. No bickering, but a plain statement of true facts is elicited from the answers given. The jury did get the proper impressions from such testimony and the dignity of the two professions, law and medicine, was upheld before both Court and Jury. Truthful testimony injures no doctor. It is the sly insinuations by the lawyer and half-truths told by the witness doctor that spoil the best reputations.

The dreamed of ideal is becoming in truth a reality. B.J.B.

SECOND CONGRESS

Among several programs of unusual interest to be staged in connection with the 86th Annual Meeting of the Minnesota State Medical Association at the Minneapolis Auditorium May 31, June 1 and 2, is the second Congress of Allied Professions.

With an extended national health program about to be introduced into Congress, with new plans for medical practice in the air, with physicians under fire from many quarters, this second Congress assumes a great importance in the history of Minnesota's progress in medicine and public health.

The program for the Congress will include an outline of the attitude and plans of the Administration in Washington, also of the current program in Minnesota and practical possibilities for its extension. There will be a discussion likewise of various aspects of sickness insurance, both voluntary and compulsory. Speakers are being chosen very carefully to present different points of view and the program will consume an entire day of program time during which there will be no scientific sessions beyond the regularly scheduled exhibits and demonstrations.

The interest of physicians in public health education will be graphically demonstrated in a public health exposition which will occupy the ground floor of the Auditorium and which will be open to the public during the entire three days of the meeting. Every phase of health protection and disease prevention with which the average person should be acquainted will be demonstrated in this exposition. Appropriate committees of the state association will be responsible for the material shown. They will have the enthusiastic coöperation of all official and voluntary agencies interested in special phases of public health work.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

License of Two Hallock Physicians Suspended for Eighteen Months

In the Matter of the Revocation of the License of Kenneth Vincent Overend, M.D.

In the Matter of the Revocation of the License of Fred Earl Myers, M.D.

The Minnesota State Board of Medical Examiners at a meeting held on December 16, 1938, suspended for eighteen months, the license to practice medicine and surgery held by Kenneth Vincent Overend, M.D., and Fred Earl Myers, M.D., of Hallock, Minnesota.

Drs. Overend and Myers practiced together at Hallock and following an extended investigation by the Medical Board they were cited to show cause why their licenses as physicians should not be revoked for conduct unbecoming a person licensed to practice medicine and detrimental to the best interests of the public. Both of them entered pleas of guilty before the Board. The evidence disclosed numerous cases of bilateral salpingectomies and other surgical procedures, some of which resulted in the miscarriage of the patient.

Mankato Physician's License Revoked

In the Matter of the Revocation of the License of Arthur W. Eckstein, M.D.

The license to practice medicine and surgery held by Arthur W. Eckstein, M.D., Mankato, Minnesota, was revoked by the Minnesota State Board of Medical Examiners on December 16, 1938. Dr. Eckstein was found guilty by the Medical Board of "immoral, dishonorable and unprofessional conduct," and, specifically with procuring, aiding and abetting a criminal abortion.

In 1932 Dr. Eckstein was before the Board on a similar charge and was reprimanded and placed on probation. In 1934 Dr. Eckstein pleaded guilty in the District Court at Mankato to the crime of abortion and was sentenced to two years at hard labor in prison. Upon his release he pleaded with the Medical Board for a chance to take the examination for a new license. Numerous physicians in Mankato endorsed him and a license was finally issued. Dr. Eckstein's first license was revoked in May, 1934.

In the present case Dr. Eckstein was seen on October 17, 1938, in the act of throwing a package over the Minnesota River bridge at Mankato. Subsequent investigation disclosed the contents as a fœtus, with the head severed from the body. He was arrested on the next day charged with abortion. Eight witnesses testified before the Medical Board. The criminal case at Mankato has not been disposed of.

License of Lake City Physician Suspended for Five Years

In the Matter of the Revocation of the License of Gottfried Schmidt, M.D.

The Minnesota State Board of Medical Examiners, on December 16, 1938, suspended for five years the license to practice medicine and surgery held by Gottfried Schmidt, M.D., Lake City, Minnesota. Dr. Schmidt was found guilty by the Medical Board of advertising "professional superiority to, and greater skill than, that possessed by fellow physicians and surgeons" and of "conduct unbecoming a person licensed to practice medicine and detrimental to the best interests of the public."

Numerous complaints had been received by the Medical Board as to the methods used by Dr. Schmidt in making a diagnosis and also in his manner of treating ailments. Letters also had been referred to the Board that were written and mailed by Dr. Schmidt, in his practice, to patients and others. These letters in the opinion of the Board are highly improper. Dr. Schmidt attempted to diagnose diseases by having the patient place some saliva on a piece of paper. Out of town patients mailed this paper to Dr. Schmidt at Lake City. He then proceeded to treat the patient by medicine sent through the mail. He also stated that he had a machine with which he could broadcast treatments.

Dr. Schmidt was admonished by the Board in 1936 to refrain from these practices. However, he persisted and the citation resulted. Dr. Schmidt was born in Minnesota in 1871 and graduated in medicine from the University of Minnesota in 1903.

Medical Board Orders the Kru Gon Company to Cease Operations in Minnesota

Following an investigation, conducted by the Minnesota State Board of Medical Examiners, The Kru Gon Company of Muncie, Indiana, was ordered to cease operations in the State of Minnesota on December 6, 1938. The investigation discloses that this company had a representative, one Edward L. Pepper, seventy-two years of age, who holds no license to practice any form of healing in the State of Minnesota, operating in the Rask Drug Store at Willmar, Minnesota. When an agent of the Medical Board asked Mr. Pepper what conditions Kru Gon Capsules were recommended for, he replied: "Stomach, liver and kidneys." When he was asked if they were of any value in the treatment of a gall bladder condition, he replied, "Absolutely." When he was asked what effect they would have upon gall stones, he replied that Kru Gon capsules would "dissolve" them. The drug store received 20 per cent commission on the amount taken in by the Kru Gon man, with the company paying the agent a salary. Mr. Pepper admitted that he knew nothing about the ingredients of the capsules and that while he had been with the company for 10 years, he had never been to the home office at Muncie, Indiana, nor did he know anything about the company. Advertising material was published in the local newspaper to stimulate business and contains many statements of a very questionable nature. When Mr. Pepper was advised that a complaint would be filed charging him with a violation of the Medical Act, and that this method of doing business would not be tolerated in the State of Minnesota, the company advised that they were ceasing operations at once.

The State Board of Medical Examiners is of the opinion that the acts in this case constitute a violation of the Minnesota law against fraudulent, misleading and deceptive advertising, as well as a violation of the Medical Act and the Basic Science Law. The Board respectfully requests that it be immediately notified if this company, or any representative of it, operates at any place in the State of Minnesota. To the Board's knowledge this company has operated in Winona, Duluth, Hibbing, Faribault and Mankato, in addition to Willmar.

Chiropractor Re-sentenced to a Term of Not to Exceed Eight Years in Prison

State of Minnesota vs. Herman V. Feenstra

On November 21, 1938, at Glencoe, Minnesota, Judge Joseph Moriarty sentenced Herman V. Feenstra, sixty-five years of age, to a term of not to exceed eight years in a Minnesota penal institution. Feenstra, an itinerant, unlicensed chiropractor, had been sentenced, on August 10, 1938, to a term of not to exceed four years in prison, following his plea of guilty to an information charging him with the crime of abortion. The investigation disclosed that Feenstra had a prior conviction in the Circuit Court at Brookings, South Dakota, for a similar crime, and under the Minnesota law, his sentence was doubled. Feenstra was first arrested in Minnesota, on August 8, 1938, by the late Sheriff Beihoffer of Glencoe.

At the time of his arrest, Feenstra stated that he graduated from the Davenport School of Chiropractic in 1922. He stated that he practiced chiropractic, for a time, at Elkton, South Dakota, but lost his license because of performing abortions. The records of the Circuit Court of Brookings, South Dakota, show that Feenstra forfeited a $2,500.00 cash bond on January 19, 1938, at which time he was under arrest on a charge of rape. Feenstra never held any license to practice any form of healing in the State of Minnesota.

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SCHOOL OF MEDICINE

Dr. Frederick P. Arny of Preston, has been appointed coroner of Fillmore County.

* * *

The engagement has been announced of Miss Lucille Quinn, of Minneapolis, and Dr. John R. Meade of Saint Paul.

* * *

Dr. A. L. Abraham of Duluth, was the principal speaker at a meeting of the Arrowhead X-Ray Technicians Society held early in December. He spoke on "Some Technical Problems."

* * *

Dr. J. D. Camp of Rochester, was the toastmaster at the banquet of the Twin Cities Society of X-Ray Technicians held December 10 at the Curtis Hotel in Minneapolis.

* * *

Dr. L. M. Randall and Dr. W. B. Hunt of Rochester, were in charge of the program for the Travel Club, composed of midwest obstetricians and gynecologists, which met in Rochester on December 3.

* * *

Dr. Theodore W. Stransky, formerly located at Mandan, North Dakota, has returned to his native city, Owatonna, where he has opened offices for the practice of medicine.

* * *

Dr. Leslie G. Seebach of Red Wing, who has been an interne at Ancker Hospital, has qualified for appointment to the grade of assistant surgeon in the United States Naval Medical Corps, with the rank of lieutenant.

* * *

Dr. Charles F. Code, recent recipient of the Theobald Smith Award, has been appointed instructor in physiology at the University of Minnesota for the current year. Dr. Code has worked the past three years at University College, London, and at the Mayo Foundation.

* * *

The engagement is announced of Miss Helen Butler, daughter of Mrs. R. N. Goldthwaite of Fort Sill, Oklahoma, and the late Colonel Clifton M. Butler, to Dr. Carl N. Giere, son of Dr. E. O. Giere, Saint Paul. Dr. Carl Giere is a University of Minnesota Medical School graduate.

* * *

Correction: In the General Interest section of the December number Dr. Walter H. Judd, medical missionary, was erroneously stated to be the son of the late Dr. E. Starr Judd. Dr. Walter Judd is not related to the late Dr. Judd, although the family name is the same.

Dr. Milo M. Loucks, formerly of Flandreau, South Dakota, has located in Rushmore for the practice of medicine. He was Assistant Surgeon General of the South Dakota area of the United States Army for six years, and previous to that was an instructor at the University of Minnesota.

* * *

The docks and elevators Section of the Duluth Chamber of Commerce Industrial Safety Conference which met on December 7, at the Hotel Duluth, was addressed by Dr. G. A. Hedberg of Nopeming, on the subject of "Dust and Lungs." Other physicians appearing on the program, which was arranged by the St. Louis County Medical Society, were Dr. A. G. Athens, Dr. M. H. Tibbetts, Dr. F. T. Elias and Dr. Gordon MacRae. Dr. G. A. Earl of Saint Paul spoke on "Social Medicine."

* * *

Dr. Charles F. McComb, Duluth, eight times elected coroner of St. Louis County, retired the first of the year at the age of eighty-one. He will be succeeded by Dr. John W. Ekblad, who was elected to the office last November.

Dr. McComb was president of the Minnesota State Medical Association in 1888, was the first president of the Interurban Academy of Medicine and was twice president of the St. Louis County Medical Society since beginning practice in Duluth in 1883.

* * *

Medal Presented to Dr. Meyerding

Formal public presentation of the medal and scroll for distinguished service to the Minnesota State Medical Association was made to Dr. E. A. Meyerding at the state association banquet in connection with the 85th Annual Meeting in Duluth, June 30.

The presentation took place immediately after the Council action instituting the honor and before the committee appointed had selected the emblem.

A hand illuminated parchment and a gold medal bearing the seal of the association were later completed and inscribed in accordance with orders of the committee and actual presentation took place December 15 at a luncheon meeting of the Council at the St. Paul Hotel.

Dr. A. W. Adson, Rochester, chairman of the special committee, made the presentation. Dr. C. A. Stewart, Minneapolis, and Mr. W. W. Will, Bertha, the other committee members, also President J. M. Hayes of Minneapolis, Dr. George Earl, St. Paul, and Dr. W. F. Braasch, Rochester, recalled Dr. Meyerding's important contributions to medical organization in Minnesota and joined in praising the decision to award to him the first honor of this kind ever bestowed in Minnesota.

A similar medal and scroll will be awarded to other leaders who may from time to time merit the honor.

REPORTS and ANNOUNCEMENTS

MEDICAL BROADCAST FOR JANUARY

The Minnesota State Medical Association Morning Health Service.

The Minnesota State Medical Association broadcasts weekly at 11:00 o'clock every Saturday morning over Station WCCO, Minneapolis (810 kilocycles or 370.2 meters), and Station WLB, University of Minnesota (760 kilocycles or 395 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month will be as follows:

January 7—Pneumonia.
January 14—Sciatica.
January 21—Anorexia Nervosa.
January 28—Heredity and Dental Caries.

MISSISSIPPI VALLEY MEDICAL SOCIETY 1939 ESSAY AWARD

The Mississippi Valley Medical Society offers a cash prize of $100.00, a gold medal and a certificate of award for the best unpublished essay on a subject of interest and practical value to the general practitioner of medicine. Entrants must be members of the American Medical Association. The winner will be invited to present his contribution before the next annual meeting of the Mississippi Valley Medical Society at Burlington, Iowa, September 27, 28, 29, 1939. All contributions MUST NOT exceed 5,000 words, be typewritten in English in manuscript form, submitted in five copies, and must be received NOT later than May 1, 1939. Further details may be secured from Harold Swanberg, M.D. Secretary, Mississippi Valley Medical Society, 209-224 W. C. U. Building, Quincy, Ill.

POSTGRADUATE INSTITUTE OF THE PHILADELPHIA COUNTY MEDICAL SOCIETY

The fourth annual Postgraduate Institute of the Philadelphia County Medical Society will be held in the Bellevue-Stratford Hotel, Philadelphia, during the week beginning March 13, 1939. The program will consist of some eighty-six clinical lectures on the general subjects of blood dyscrasias and metabolic disorders.

Philadelphia has always been in the van of medical progress and the yearly institute, at which last year there was a registration of 1,787, affords an opportunity for the several medical schools located in the city to present the results of their investigative labors.

The Philadelphia County Medical Society, Twenty-first and Spruce Street, Philadelphia, may be addressed for particulars.

EAST CENTRAL MINNESOTA

The East Central Minnesota Medical Society held its annual meeting on Monday, December 12, 1938, in Cambridge, Minnesota. Dr. Arthur Neumeier and Dr. Abraham Gunz of Lindstrom and Dr. Gladys Trommold of Anoka were elected to membership in the Society. Dr. Raymond Gully, formerly associated with the Nicollet-Le Sueur Medical Society was accepted as a transfer. The Society elected to honorary membership Dr. Thomas Zeien of North Branch.

The following officers were elected for the coming year: Dr. A. L. Arends, Sandstone, president; Dr. Walter P. Gardner, Anoka, vice president; Dr. Claire M. Ness, Cambridge, secretary-treasurer; Dr. H. C. Cooney, Princeton, delegate; and Dr. George Schlesselman, Anoka, alternate delegate.

Dinner was served and a scientific program was presented by guest speakers. Dr. Erling Platou of Minneapolis spoke on "Convalescent Sera as Therapeutic Agents," demonstrating with movies the technic of preparing the sera. Dr. Gordon Kammann of Saint Paul talked on "Neurosis."

MINNESOTA SOCIETY OF INTERNAL MEDICINE

Dr. Moses Barron of Minneapolis was elected president of the Minnesota Society of Internal Medicine at a meeting held in Rochester on December 3. Dr. R. M. Wilder of Rochester was elected vice president and Dr. Max H. Hoffman of Saint Paul was reelected secretary-treasurer. D. G. B. Eusterman of Rochester is chairman of the Executive Committee; Dr. E. L. Tuohy, Chairman of the Education Committee. Minneapolis was selected as the place for the spring meeting.

NICOLLET-LE SUEUR COUNTY SOCIETY

At the annual meeting of the Nicollet-Le Sueur County Medical Society, held in Le Sueur on December 13, Dr. Nels Sonneyson of Le Sueur was elected president and Dr. P. J. Hiniker of Le Sueur, secretary. Dr. Burton Grimes of St. Peter was elected vice president.

Dr. Hobart Johnson, who has been a medical missionary for several years, gave a talk on "Practice of Medicine in Africa."

RAMSEY COUNTY SOCIETY

The following officers were elected at the meeting of the Ramsey County Medical Society, held Monday night, November 28, in the Lowry Medical Arts Building, Saint Paul: Dr. George N. Ruhberg, president-elect for 1940; Dr. R. B. J. Schoch, president; Dr. Arnold P. Gruenhagen, vice president; Dr. J. Allen Wilson, secretary-treasurer.

ST. LOUIS COUNTY SOCIETY

The annual meeting of the St. Louis County Medical Society was held on December 8 in Duluth. Dr. T. L. Chapman of Duluth, was elected president-elect; Dr. Gage Clement, Duluth, president; Dr. Andrew Sinamark, Hibbing, vice president, and Dr. Gordon MacRae, Duluth, secretary-treasurer.

Mr. J. G. Crownhart, executive secretary of the Wisconsin Medical Association, who was the principal speaker at the dinner, discussed the subject, "Socialized Medicine."

STEARNS-BENTON COUNTY SOCIETY

The Stearns-Benton Medical Society held its annual dinner at the Breen Hotel in St. Cloud on December 15. The following officers were elected: Dr. C. S. Donaldson, Foley, president-elect; Dr. W. T. Wenner, St. Cloud, president; Dr. E. M. Kingsbury, Clearwater, vice president; Dr. J. N. Libert, St. Cloud, secretary-treasurer.

UPPER MISSISSIPPI SOCIETY

The next meeting of the Upper Mississippi Medical Society will be held at the Ransford Hotel, Brainerd, Saturday, January 28, 1939. The following program will be given beginning at 3:30 p. m.:

Dr. Gordon Kamman, Saint Paul
"Vitamins and Encephalitis"

Dr. Viktor O. Wilson, Minneapolis
"The Basis for a Maternal and Child Health Program"

Dr. Chester A. Stewart, Minneapolis
"Nutritional Problems in Infancy"

Dr. O. J. Campbell, Minneapolis
"Some Observations on the Care of Fractures"

Dr. H. E. Michelson, Minneapolis
"Dermatology"

IMMUNE GLOBULIN (Human)

A preparation of globulins made from human placental blood and containing immune factor or factors against measles. The immunizing potency of the product is determined on the basis of the diphtheria antitoxin titer of the placental blood. Immune globulin (human) is useful in the prevention and modification of measles. It is equivalent in usefulness to convalescent serum but has the advantage of universal availability. It has the disadvantage of producing reactions not always mild. Most reactions, however, can be avoided by administration of the proper dosage. It is useful in the prevention of measles in institutional cases in larger doses than those given for modification. Protection should not be attempted until definite exposure has taken place. Immune globulin (human) has also been used (with caution) in the treatment of measles.

WOMAN'S AUXILIARY

Mrs. J. F. Norman, Crookston, *President*
Mrs. A. A. Passer, Olivia, *Editor*

GREETING FROM THE STATE PRESIDENT

'Tis said, "It is never too late for a good wish." So, with the Christmas holidays disappearing only just around the corner, I welcome an opportunity to express again my sincere wish for a happy, and a prosperous New Year to every individual member of the Women's Auxiliary.

May the coming year bring to each one of us, strength and courage to face our own responsibilities without faltering.

Let us encourage the medical profession—our husbands—in the face of a trying situation to keep their ideals untarnished, to preserve the tolerance, and sympathetic understanding, the dignity and courtesy that has always made them a distinguished group among all men.

May we have renewed faith in ourselves, and in each other.

Elizabeth B. Roberts,
State President

REPORT OF THE PRESS AND PUBLICITY CHAIRMAN

On November 8, members of the Washington County Medical Auxiliary met with their president, Mrs. J. W. Stuhr, presiding. This was their first meeting of the season. Five dollars was donated to the Scout Fund and five dollars to the High School "Radio Educational Project." A committee was appointed to outline the plans for the work of the year.

* * *

At the November meeting of the Women's Auxiliary to the St. Louis County Medical Society, a turkey luncheon was served at one o'clock at the home of Mrs. D. C. Rood. Mrs. M. G. Gillespie, the president, presided. The meeting was followed by a musical program given by Mrs. Anderson Hilding, violinist, and Mrs. Donald MacGregor, pianist. A rummage sale was held in November under the supervision of Mrs. P. S. Rudie, Mrs. M. G. Gillespie, Mrs. C. M. Smith, and Mrs. Harry Klein. The proceeds from this sale are used for the philanthropic activities, which includes the distribution of Christmas baskets.

* * *

The Hennepin County Auxiliary has had a most active season so far this year. On Wednesday, December 14, Mrs. F. A. Erb was hostess to the Hennepin County Auxiliary at Sarahurst, convalescent home for patients discharged from the Glen Lake Sanatorium, which is maintained by the Hennepin County Tuberculosis Association. The hours were from 2 to 4. Friday, December 2, the Hennepin County Auxiliary had its annual Christmas party in the lounge of the Medical Arts Building. A silver offering went for the rehabilitation home, Sarahurst. Mrs. A. E. Benjamin, Mrs. E. S. Strout, Mrs. J. M. Hall and Mrs. R. R. Noice comprised the hospitality committee. Christmas carols and Christmas legends were heard. New members of the Hennepin County Auxiliary were honored at a tea which was given in October at the home of Mrs. H. M. Lee, 4848 Russell Avenue South. The new members and officers were the guests of honor. Hennepin County officers for the year are: Mrs. R. R. Crammer, president; Mrs. E. S. Mariette, president-elect; Mrs. C. E. Willcutt and Mrs. J. S. Reynolds, vice presidents; Mrs. Harold G. Benjamin, recording secretary; Mrs. C. W. Laymon, corresponding secretary; Mrs. J. P. Hiebert, treasurer; Mrs. R. R. Noice, auditor, and Mrs. H. B. Hannah, custodian. Mrs. W. J. Byrnes is president emeritus and also serves as parliamentarian; Mrs. J. D. Lyon is historian and Mrs. J. S. Milton, editor.

Committee chairmen include Mmes. L. R. Boies, J. M. Neal, C. D. Creevy, J. M. Hayes, A. H. McFarland, P. J. Schultz, W. G. Beckman, F. A. Erb, J. C. Davis, Leo W. Fink, J. A. Watson, Hugh Tunstead, J. M. Hall, G. T. Nordin, W. W. Moir, Martin Nordland and J. A. Polzak.

At the October meeting the members heard a talk on current books given by Mr. J. H. Kittleson. On November 18 and 19 the auxiliary sponsored their annual sale of articles made by patients at Glen Lake Sanatorium, proceeds going to the makers of the articles. The Philanthropic Committee includes Mrs. J. C. Davis, chairman, assisted by Mrs. N. H. Lufkin, L. F. Richdorf, J. C. Miller, L. M. Larson, F. L. Jennings and Donald McCarthy.

* * *

Nearly 10,000 talks were written by high school students throughout the state on the subject, "Tracking Down the Foe of Youth" in a contest conducted by the Minnesota Public Health Association in coöperation with the Women's Auxiliary of the Minnesota Medical Association. This was the eighth annual contest in which the Auxiliary participated. Mrs. Martin Nordland, Minneapolis, former state president, represented the Auxiliary on the committee of judges.

The best talk from each high school, selected by a preliminary public speaking contest, was entered in the state contest. From the manuscripts submitted, the judges selected the six talks they considered best, which were presented by their authors in a series of special broadcasts over WCCO during the week of December 12. Competing in the broadcasts for the radio plaque and silver cup awarded by the Auxiliary, were John Christianson, Moorhead; Robert Schwartau, Goodhue; Helen Kessler, St. Joseph's Academy, Saint Paul; Rosemary Perkins, Technical High School, St. Cloud; Jean Esala, Aurora; Betty Wallin, Red Lake.

Winners in the finals were John Christianson, Junior High, Moorhead; and Betty Wallin of the Red Lake Senior High School, located on the Indian reservation.

The following article is from the newsletter of the Woman's Auxiliary of the American Medical Association in which Mrs. Charles C. Tomlinson, the national president, tells of her visit to Minnesota the latter part of September:

"On Sunday, September 26, I left for Minneapolis to attend the Minneapolis Executive Board meeting—a very splendid meeting presided over by Mrs. W. B. Roberts, whose leadership assures a most successful year for Minnesota. Minnesota reports a steady increase of activity and membership, with twenty-five active units and over 1100 members. It was my privilege to share honors with Dr. Hayes, president of the Minnesota State Medical Society, in addressing the meeting. The interest and coöperation of this group was well attested by the attendance. When I entered the well-filled dining room of the Country Club, I wondered if I had misunderstood the invitation and was finding myself at a state convention. Again I saw many familiar national Auxiliary figures—Mrs. Martin Nordand, Mrs. S. S. Hesselgrave, Mrs. John Catlin, Mrs. Wm. Byrns, and our own past national president and present finance chairman, Mrs. James Blake. Through the courtesy of Dr. W. B. Roberts it was my pleasure to see the beautiful city of Minneapolis at its best. The restful lakes, beautiful homes, shrubbery and trees, already tinted to indescribable hues by the frost of Indian Summer. Tuesday morning, September 27, at the invitation of Dr. E. A. Meyerding, secretary of the Minnesota Public Health Association, I attended a breakfast given in Saint Paul, at the Hotel Lowry, honoring Mrs. Saidie Orr Dunbar, president of the General Federation of Women's Clubs. In the afternoon I was honor guest at a beautiful tea given by the Ramsey County Auxiliary at the home of Mrs. Edward Schons. It was a real joy to meet and know Mrs. A. E. Nichols, president of the Ramsey County Auxiliary, and the other members of this progressive group. A most enjoyable visit at Hopkins, in the home of Mrs. James Blake, completed my sojourn to Minnesota."

* * *

On December 18 and 19 the members of the Women's Auxiliary of the Ramsey County Medical Society sponsored the play, "The Dream of a Clown," which was given at the Saint Paul Auditorium. The proceeds from this play will be used for various philanthropic purposes which will be announced in the next issue.

The Auxiliary received a nice response from members of the Ramsey County Medical Society and cooperation on the part of many prominent citizens and Saint Paul officials in this rather unusual performance. All parts were taken by members of the male sex and no little unexpected talent was displayed. The audience was kept in a constant state of laughter at the appearance and behavior of the actors.

MINNEAPOLIS SURGICAL SOCIETY

Stated Meeting, Thursday, November 3, 1938

RECENT ADVANCES IN THE SURGERY OF THE NECK

Martin Nordland, M.D.
Minneapolis

In the discussion of recent advances in the surgery of any region it is customary to review the history of the subject. Outside of the story of goiter, the history of the treatment of the various disorders about the neck resolves itself into the recording of occasional developments of certain new procedures. The treatment of the thyroglossal duct cyst by Sistrunk and the accidental development of the operation of tenotomy for the relief of symptoms from cervical rib by Adson are conspicuous examples. Patients with these disorders or pulsion diverticuli of the pharynx are encountered so seldom by the surgeon of average experience that mistakes in diagnosis are common and surgical mismanagement is frequent. This discussion will be limited to a brief review of the treatment of these conditions and to some of the newer developments in the management of goiter.

The surgeon has some important responsibilities beyond the immediate mortality which are peculiar to the treatment of the disorders of the neck and which are not common to the surgery of other regions. In the block dissection of the glands of the neck, because of the motor paralysis, he must protect and avoid the descending hypoglossus nerve; in the treatment of branchiogenetic and thyroglossal duct cysts he must consider and be responsible for recurrences. In the surgery of the thyroid he must be concerned not only with the mechanical complications such as injury to the parathyroid bodies and laryngeal nerves, but also he must be mindful of a good functional result. To deal with these responsibilities, he must be thoroughly familiar with the anatomy of the neck and be informed concerning the problems of hypo- and hyperthyroidism. The appearance of the scar is not the least of the surgeon's responsibilities in the surgery of this region. Patients are exacting. They demand an invisible scar corresponding to the natural folds of the neck, and justly so.

Thyroglossal Duct Cysts and Fistulæ

How rarely the patients with thyroglossal duct cysts are encountered by the surgeon of average experience is emphasized in a review of the technic of the treatment of this condition which was published by Sistrunk in 1928. He stated in his report that in 86,000 consecutive patients examined in the Mayo Clinic, only thirty-one thyroglossal duct cysts were found. Lack of thorough understanding of the mode of development of such cysts and of the anatomy of the base of the tongue and surrounding structures has frequently led to a wrong diagnosis and improper surgical management. It should not be difficult to make a diagnosis of such cysts with this knowledge of their congenital origin. The tumor is usually a firm cystic mass in the midline of the neck near the hyoid bone or the thyroid cartilage. The duct which runs from the cyst to the hyoid bone is usually felt. Sistrunk pointed out that operation for the cure of thyroglossal duct cysts and fistulæ are unsuccessful unless the epithelium-lined tract running from the cyst to the foramen cecum of the tongue is completely removed. He further pointed out that it is better not to attempt to isolate the duct above the hyoid bone because it is so small and friable. He suggested it was better to include some of the tissue on all sides around the duct from the hyoid bone to the foramen cecum. It is a harmless operation and, properly performed, prevents recurrences and results in 100 per cent of cures.

Pharyngeal Pulsion Diverticuli

The treatment of pulsion diverticuli of the pharynx recently developed by Chevalier Jackson is worthy of brief consideration. The technic he has recommended makes it possible for the surgeon of average experience to deal with this condition with good results. He has suggested the use of the esophagoscope in the dissection of the sac. With this aid the pouch is found more quickly and the contaminating contents can easily be removed before the sac is excised. This makes a cleaner operation. Jackson has found that an accurate dissection and excision of the cleaned sac and a closure with the finesse of arterial suture results in a safe one-stage operation. He further recommends a transverse incision in the natural fold of the neck. This, he contends, makes for better support and for inconspicuous healing.

Cervical Rib

The first important paper on the treatment of cervical rib was written in 1740 by Hunauld. More than 100 years later Gruber presented the second important contribution on this subject. These, and all subsequent articles, up to the time of the work of Adson and Coffey in 1927, recommended the complete or partial removal of the rib or section and removal of the prolongation for surgical relief. While operating upon a patient, they were compelled to discontinue after they had proceeded as far as section of the insertion of the scalenus anticus muscle, intending to complete the procedure in a second stage. To their surprise, the patient was completely relieved of symptoms by simple tenotomy and since then they have practiced this as the operation of choice with much success. When possible, this procedure is better than removal of the cervical rib, in that it is simpler and avoids traction upon the brachial plexus. Simple tenotomy obviates the temporary palsy of the brachial plexus which often happens in the removal of the cervical rib and complete relief of the symptoms is obtained. The procedure is a most notable contribution to the operative relief of cervical rib pressure.

Thyroid Disease

Goiter has been a familiar malady for thousands of years. Through the work of Bilroth, Kocher, Halstead, Mayo and deQuervain, it is now more than fifty years since operations on goiter have acquired a position among the accepted procedures of surgery. The mortality rate at the present time is less than 1 per cent. A student of the history of this subject will find that some surgeons in the last century achieved almost as much in the surgical management of goiter as is being accomplished today. Much of the recent study of thyroid disease has been concerned with endocrine interrelationships, iodine in its relation to the diagnosis, prophylaxis and treatment of goiter, blood iodine and the evaluation of the basal metabolic rate. The value of polar ligation in the two-stage operation for hyperthyroidism has been recently re-established by Lahey. He has also made a valuable recent contribution in his introduction of the intratracheal catheter for anesthesia in the management of intrathoracic goiter. Total ablation of the thyroid in the treatment of heart disease has been developed since 1932. During the past five years there has been continually a repetition of attempts to cure goiter by other means than surgery. Most conspicuous of these is the application of roentgenotherapy. So far, it has not made a significant impression.

Iodine, Prophylaxis and Treatment

Although the clinical use of iodine is probably a medical problem, the surgeon who is handling patients with thyroid disease is repeatedly called on to state whether or not iodine should be used in a given case. According to Dinsmore the clear-cut indications for the use of iodine are:

1. Small doses during pregnancy, especially to women who have enlargement of the thyroid.
2. As a prophylactic measure in doses of 10 mgm. a week to school children.
3. For the adolescent boys and girls who have simple goiters.
4. As a pre-operative medication in all patients with hyperthyroidism regardless of the type of the gland.
5. In cases of residual or recurrent hyperthyroidism.
6. As a therapeutic test in borderline cases.

Blood Iodine

Many studies have recently been made relative to the value of blood iodine. Although the procedure may have distinct diagnostic value, its application is limited. Certainly there is no indication for its use in the presence of frank hyperthyroidism. It may, however, be of some value in making a differential diagnosis when it is difficult to determine the basal metabolic rate, such as in hypertension, in young children, and in encephalitis. In spite of the simplification of the technic, it is still a rather difficult laboratory procedure. In many of the borderline cases, it has been pointed out that the chief value comes in finding a normal blood iodine. Also, there are patients who have clear-cut hyperthyroidism with normal blood iodine.

Multiple Stage Operations

Lahey has re-established the importance of polar ligation and has emphasized its value. Mortality in the surgery of hyperthyroidism is due either to some lesion of the heart or kidneys or occasionally to some lung complication. A few of these patients die from postoperative crisis. It is in this last group that the two-stage operation should be employed. The use of Lugol's solution, introduced by Plummer in 1923, was a great advance in the management of hyperthyroidism. In spite of its employment in the preoperative preparation of this group of patients, there is still a group of about 5 per cent of patients with hyperthyroidism who cannot be made satisfactory surgical risks by the prolonged medical treatment. Polar ligation or a two-staged operation is imperative under such circumstances. The decision to perform a multiple stage procedure may be made preoperatively or after the operation has begun. A patient with marked hyperthyroidism whose pulse rate cannot be reduced by the administration of iodine and rest should have a two-stage operation. No patient should be operated upon for goiter in a one-stage operation who is losing weight. Patients with recent vomiting and diarrhea associated with an elevated basal metabolic rate usually need a two-stage operation. During the operation the patient with a progressively rising pulse and an increasing pulse pressure should have a two-stage operation. If, during the operation, technical difficulties are encountered, such as excessive bleeding, consuming much time, a two-stage operation should be contemplated. Lahey asserts that 22 per cent of the patients in his clinic are subjected to the preliminary polar ligation. He reasons that a patient with hyperthyroidism dying following a one-stage operation, might have lived with a two-stage resection; and, further, that a patient dying after a two-stage resection might have lived with a preliminary ligation of one or both of the superior poles.

Intrathoracic Goiter

In the surgical management of the intrathoracic goiter, Lahey has recently advocated intratracheal anesthesia. Whether one employs ether, nitrous oxide gas, ethylene, or cyclopropane, the most recent anesthesia which is now being used, it then becomes purely a matter of the anesthetist's choice so long as an intratracheal catheter has been introduced.

In all intrathoracic goiters in which there is any considerable narrowing of the trachea and in which the intrathoracic tumor is of any considerable size, there will always be the danger of difficulty in making the tumor pass through the upper thoracic strait, thus producing pressure upon the trachea and, without an intratracheal catheter, causing the danger of suffocation.

It should be borne in mind in dealing with the tracheal obstruction in intrathoracic goiter that the performance of tracheotomy is extremely undesirable.

With the tube in place, any amount of manipulation and pulling, hauling and prying of the mass out of the mediastinum can be undertaken without danger of interfering with the respiration.

Total Thyroidectomy for Heart Disease

Total ablation of the thyroid for heart disease has been developed since 1932. According to Berlin, only those patients should be selected for this operation who, despite all available medical measures, continue to remain chronic invalids. In general, patients with slowly progressive heart disease who continue to suffer recurrent attacks of cardiac failure on exertion over a prolonged period of time will probably respond to the operation favorably, but those showing a short and rapidly progressive course should not be subjected to it. The operation is contraindicated also in the presence of severe impairment of renal function, acute pulmonary infection, or active rheumatic infection. The same consideration of the rapidity of the course of the condition should govern the selection of cases of angina. If the patient's history shows a rapid increase in the number of attacks, thyroidectomy will probably not give lasting results. When the metabolism is minus 15 per cent, operation should not be recommended. Of Berlin's patients with angina pectoris or congestive failure who were operated upon from one to two and one-half years ago, approxmiately 70 per cent showed marked or moderate improvement following the total ablation of the thyroid gland. In the last sixty-two cases there was no operative mortality. Berlin called attention to the danger of bilateral injury of the recurrent laryngeal nerve and advised laryngoscopic examination after the ablation of one lobe.

X-ray Treatment of Hyperthyroidism

Roentgen therapy has frequently been suggested in the treatment of hyperthyroidism. While it is admitted that in a large number of cases treated by x-ray there is a gradual improvement of the patient, radiotherapeutic methods have several serious drawbacks. The dosage is difficult to determine. The favorable result in the beginning may, due to the cumulative action of the x-rays, eventually prove to be excessive. This treatment has none of the precision of the operative treatment. It cannot conceivably be of any benefit in toxic adenoma. Arnold Jackson states that in the cases he has observed that have been treated with x-ray, the goiter has not been cured but the basal metabolism rate has been merely decreased so that the patient continues to run a low-grade hyperthyroidism. As a result of this the myocardium gradually becomes damaged and permanent injury results. He has seen a great many failures from x-ray therapy, and also a large number of cases with burns of the skin. Means and others have expressed similar opinions.

deQuervain asserts that radiotherapy is contraindicated in those cases of goiter which sooner or later come to operation. He states that inherent difficulties of an operation for exophthalmic goiter are increased to such an extent by x-ray as to almost render the operation impossible and that the adhesions after x-ray treatment are only to be compared in many cases to those produced by a previous thyroidectomy and usually they are more marked.

deJ. Pemberton in discussing the employment of irradiation in the treatment of exophthalmic goiter states that "it is based on the conception that the hypertrophic parenchymatous cells of the thyroid gland, as well as the lymphocytic infiltration commonly associated with the histologic changes found in this disease, are peculiarly radiosensitive, while the normal cells are peculiarly radioresistant. The functional activity can thereby be diminished without destruction of structure. Experimental proof is lacking that involutional changes occur in the thyroid gland of exophthalmic goiter after irradiation, for the difficulties of obtaining specimens from patients with exophthalmic goiter before and after irradiation are obvious. However, in a series of 4,061 patients with exophthalmic goiter operated on in The Mayo Clinic in 1926 to 1928, inclusive, the records show that 291 (5 per cent) had had previous treatment with irradiation. At operation only occasionally could the surgeon recognize any gross changes in the gland itself to indicate that it had been iradiated, and Broders was unable from miscroscopic study to distinguish that irradiated tissue from tissue that had not been irradiated." He further states that "after recognition of the value of iodine in reducing the operative mortality among patients with exophthalmic goiter, a paper was published by all the members of the committee of the Massachusetts General Hospital in which they compared the results of irradiation with those of surgery, and concluded that iodization followed by subtotal thyroidectomy is the best treatment of exophthalmic goiter. It is significant that the conclusion reached by this group of internists, surgeons and radiologists, namely, that surgery offers the best results in the treatment of exophthalmic goiter, tallies with the conclusions of similar groups of observers who have had wide experience in the care of patients with this disease. In The Mayo Clinic, irradiation has been employed in selected cases of exophthalmic goiter. In a small proportion of the cases, improvement has followed treatment, whereas in the others no change in the severity of the hyperthyroidism could be detected. Since the administration of iodine has proved superior as a preoperative preparatory method, irradiation has not been used in recent years except occasionally in a very small group of cases refractory to iodine. In these, the results have not been encouraging."

Personally, I believe that x-ray treatment is indicated in a certain small group of cases with hyperthyroidism when this treatment is administered by properly trained roentgenolists.

Discussion

Dr. L. H. Fowler: We are indebted to Dr. Nordland for a very interesting and complete survey of some of the important surgical conditions of the neck. There are several points worthy of discussion but in view of the length of the program, I feel that we should proceed with the other papers of the evening.

PRESENT STATUS AND MODERN ADVANCES IN THE SURGERY OF THE CHEST

Thomas J. Kinsella, M.D.
Minneapolis

Chest surgery is the youngest but at the same time probably the oldest special division of surgery. It is the youngest in its marked recent development but oldest by historical record for any of you who happen to be familiar with the Good Book may remember where it says "The Lord cast a deep sleep over Adam" and then the resection of the rib followed.

The modern developments in thoracic surgery have come about for three principal reasons: (1) improved diagnosis in the various conditions within the chest; (2) improved knowledge of the physiology of the chest, not so much from the standpoint of the physiologist as appreciation of it by the surgeon; (3) improvement in anesthesia and anesthetic technique and the use of oxygen therapy which has made many things possible in chest surgery.

Among the improvements in diagnosis which have come about in the last ten years or so, I think one should be mentioned specifically. It is an improvement in x-ray technic, in the use of the tomograph or laminograph through which it is possible to make films as serial sections a centimeter or two in thickness for the localization of abscesses, foreign bodies and various other lesions. They have been of great value and they will be of more value as time goes on. The method is not in common as yet but it is not a difficult matter to construct the apparatus and it will help us considerably in our diagnoses.

"Another thing which has helped is bronchoscopic examination and bronchoscopic treatments in thoracic lesions. Many of the conditions that we see in chest surgery now are better understood because of the knowledge which has been contributed through bronchoscopy, yet even today bronchoscopic examinations are not performed nearly as frequently as they should be. Esophagoscopic examination is also of value but likewise is not used as much as it should be. Another step in diagnosis which is neglected very often is the aspiration of fluid from the chest and replacement with air to permit better x-ray visualization of the thoracic organs and diagnosis and localization of various lesions in the chest. Careful microscopic study of aspirated fluid may help greatly in diagnosis.

Another neglected diagnostic procedure is the use of the thorascope. Where the lung is already collapsed by air or fluid is withdrawn and replaced with air a telescope or thorascope may be introduced and the interior of the thorax visualized very clearly. An accurate diagnosis may at times be made or biopsy specimens may be taken. This will eliminate a considerable number of exploratory thoracotomies, and is something that should be used more widely.

A number of years ago intrathoracic operations were somewhat of an ordeal. Under nitrous oxide anesthesia for open thoracotomy, fifteen to thirty minutes was about as much as any patient could stand, and the operation was a struggle for the patient as well as for the surgeon. Now, with modern anesthesia, it is possible to open the chest widely and leave it open for an almost indefinite period of time for surgical procedures and still keep the patient in good general condition. The use of the pressure cabinet which was used years ago when the chest was opened, has been abandoned and positive pressure anesthesia has taken its place. A knowledge of the effects of shifting mediastinum, movable chest wall, tension pneumothorax and sucking chest wounds, have all aided in our handling of thoracic conditions and helped us to treat these conditions much more safely than we could before such things were properly understood.

As far as anesthesia is concerned, I will leave that to Dr. Ralph Knight who really knows the subject. I merely follow along and try to work as he takes care of the patient.

Probably the first of the various phases of chest surgery that should be mentioned is the surgery of pulmonary tuberculosis. I mention this first not because I am interested in it primarily but because it constitutes such a large percentage of thoracic surgery today. Thoracoplasty, of course, is used much more widely now than it was a few years ago. All types of collapse therapy, in fact, are used more commonly. Ten years ago at Glen Lake only about 10 per cent of the patients discharged from the Sanatorium had been treated by any type of collapse while in 1937 53 per cent of the patients discharged had been so treated. This is just an indication of the increase in the use of such procedures. Thoracoplasty, of course, is not a new operation and there are probably more varieties than there are kinds of Heinz pickles. There are many special methods. Personally, I think that you should fit your survery to your patient, fit the type of operation to what the patient needs and can tolerate rather than to follow any special routine. One of the variations in thoracoplasty which has been developed in the last few years is the so-called Semb operation or an extra-fascial apicolysis in which, in addition to thoracoplasty, there is added a dissection of the dome of the pleura from the bands of Sibson's fascia, Sibeleau or Zuckerkandl bands, to allow the lung to collapse not only in a lateral and antero-posterior direction but also in a vertical direction. I believe there are some advantages to this procedure, but I don't think it is something to use as a routine. Probably 25 per cent of patients as we see them need something of the sort, but a number of those who need it can't have it because everything is bound down too much. If it is used as a routine, of course, you will have a great many good results but about 75 per cent of the patients do not need this added collapse.

Apical stripping, true apicolysis or extrapleural stripping combined with thoracoplasty is of value. There are some disadvantages there which are not generally appreciated, largely the danger of contamination with tubercle bacilli from tearing into tuberculous tissue as well as the danger of injury to the brachial plexus, the large veins in the apex, injury to the sympathetic, etc.

The past ten years have seen the rise and fall of two types of thoracic surgery. One is phrenic nerve surgery about which many men became so enthusiastic that there were reports made of a series of several thousand performed within a few years. It was then done almost as a routine. Now it has fallen largely into disrepute. I believe that it has a definite field though it is much smaller than was originally anticipated. The same thing may be said of section of the scalene muscles to allow relaxation of the upper portion of the chest. It was used rather extensively for a while but now it is almost abandoned.

Pneumothorax, of course, is used much more widely than previously. Bilateral pneumothorax is now a common procedure whereas ten years ago it was somewhat of a rarity. It is started, of course, much earlier than it used to be. Oleothorax, that is, the substitution of an oil filling for the air pocket in pneumothorax has a definite field, particularly in patients who have to be sent out into outlying districts where they can't obtain air refills. There are certain disadvantages to it but I think it has a small field in the treatment of tuberculosis.

A new procedure which has been introduced in the last year or two, that is, extra-pleural pneumothorax, will, I believe, probably have a small field. At the present time many men are as enthusiastic about it as they were about phrenic nerve surgery a few years ago and undoubtedly will overdo it. It is used in patients who have an obliterated pleural cavity so they cannot take an ordinary artificial pneumothorax and who are not suitable for thoracoplasty. A piece of rib is resected posteriorly and parietal pleura stripped from the inside of the chest wall, apex and upper mediastinum. The wound is then sutured, leaving the space filled with saline which is aspirated in a day or so after the wound is sealed, and replaced with air. The collapse is maintained by extrapleural injections of air under positive pressure from that time on. Certain patients who are desperately ill, have large cavities, and are not good subjects for thoracoplasty or other radical surgery, may be helped by this method. It is very much an institutional type of procedure, and at the present time there are very few places where a patient can be sent out of a sanatorium and still be carried on such a procedure. Extrapleural oleothorax may be the answer to this problem.

Extrapleural paraffin "Plombe" which is not new, I believe, has received added interest in the last few years. We have had a series of approximately one hundred patients with some very nice results. It is not altogether fool-proof but there is a place for it.

Pneumo-peritoneum is another procedure which has been added to our therapeutic measures in pulmonary tuberculosis. Air is injected into the peritoneal cavity with the idea of pushing the diaphragm up, immobilizing the lung and obtaining some improvement by this immobilization. With pneumo-peritoneum it is perfectly possible to push the diaphragm up to the third rib on each side. The patient may become short of breath, or have difficulty with the gastro-intestinal tract for the stomach is collapsed by the pressure that is used. So far, I am not convinced that it has helped a great many patients. It is something to use where you cannot use anything else, and in that way may be worth while.

In general, I would say that the most important change in collapse therapy has been its wider use and earlier use. It has given us better results because the patients were in such condition that they could expect more because they had not become depleted by prolonged or extensive disease.

The field of empyema has shown little change in the last ten years. A number of trick methods of treating empyema have been introduced but they are usually fads and have not changed the field appreciably.

In the treatment of lung abscess, the old standard, two-stage external drainage is still good. Lobectomies, however, are being considered more frequently and are being used occasionally for the treatment of special cases. We have a man down at the General Hospital now in whom lobectomy was done in preference to an external drainage because of repeated profuse pulmonary hemorrhage, where we feared that he might bleed to death from the lung while we were waiting for the pleura to become adherent before the second stage. It has worked out very nicely. Bronchoscopic aspiration and localization has been of value. A considerable number of lung abscesses can be treated bronchoscopically and good results can be obtained in this way without external drainage. The whole thing is, if results are obtained in two or three treatments through the bronchoscope and adequate drainage established, all well and good. If results are not obtained within two or three treatments, then it is time to stop and do something else. There is no necessity for carrying it on for months.

The surgical treatment of bronchiectasis has received increased attention in the recent years. The Graham cautery is not used as much as previously, though I believe it still has a field in the treatment of bronchiectasis complicating pulmonary tuberculosis.

Lobectomy and pneumonectomy have been used rather widely and some excellent results obtained. The results of lobectomy have improved while the mortality has dropped from the 40 per cent of a few years ago to around 2 to 4 per cent in certain series. Pneumonectomy is still a procedure of considerable magnitude and carries a considerable risk. It is, however, justifiable in some of these patients.

Carcinoma of the lung is one condition which was untouched a few years ago but is now treated by thoracic surgery. The first case of carcinoma of the lung successfully treated by pneumonectomy was by Graham in 1933. Early diagnosis, of course, is essential. We must suspect carcinoma of the lung and look for it, bronchoscope the patient and use iodized oil or we will never find it in an operable stage. Even today about nine cases out of ten that you see have progressed too far for successful surgical treatment when the diagnosis is made. Pneumonectomy is the surgical procedure of choice as it gives a chance to remove the regional nodes as well as the whole of the involved lung. It still probably carries a mortality of about 25 per cent, depending upon local conditions but as we have nothing else to offer in carcinoma of the lung I believe the risk is justified.

Benign tumors of the lung, adenomas, etc., have been recognized in increasing numbers in the past few years and successfully treated through the bronchoscope. A considerable number of these have probably been treated by diathermy, x-ray and other means within the past ten years and reported as carcinomas of the lung and good results obtained.

The other fields in thoracic surgery have not changed particularly. There have been procedures developed for drainage of mediastinal abscesses, but it is still a very desperate condition. Mediastinal tumors have been successfully removed by modern thoracic surgery under intratracheal anesthesia. The esophagus may now be resected. There have been a number of cases in which the Thorek operation, for complete removal of the esophagus with an external communication established through a rubber tube, have been reported. A few of these have come out rather well.

Cardiac surgery has shown a few improvements but nothing startling. A number of cardiac wounds have been successfully sutured. The effects of cardiac tamponade have been recognized and the importance of its relief stressed. Pericariolysis by the Brauer operation of taking out the overlying ribs and cartilages or the more radical removal of the calcified pericardium, has been used from time to time. It is still a procedure which offers something but is not of too great value.

Two procedures have been introduced in cardiac surgery with the idea of establishing increased blood supply to the myocardium in patients with angina. In the Beck operation the pectoral muscles are transplanted into the pericardium as a pedicle flap to form adhesions and give increased blood supply. Some nice results have been reported but they have all been done on early cases, and the late results are not yet available. The O'Shaughnessy operation in which the pericardium and the diaphragm are both opened and the omentum pulled up and sutured in the pericardium to form adhesions is an accessory of the same type. The Trendelenburg embolectomy for removal of pulmonary emboli has been used a number of times, but the whole difficulty seems to lie in diagnosing what patients need it. It is probable that a considerable number of patients who have recovered might have recovered without operation. It probably never will have a very wide field of usefulness.

ANESTHESIA IN CHEST SURGERY

Ralph Knight, M.D.
Minneapolis

Even in thoracic surgery there is a considerable choice of anesthesia methods.

For thoracoplasties of not too great an extent, such as those required in the treatment of empyema cavities, and even for the removal of several ribs, especially the lower ones, in the treatment of tuberculosis, paravertebral anesthesia is always to be considered. To accomplish this 10 c.c. or a little more of a 1 per cent solution of procaine, or metycaine, is deposited just below the tip of the transverse process of each vertebra of the segments involved. With rather slow and careful surgery, to avoid too great tugging and jarring of the patient, extensive resection and even disarticulation of ribs can be accomplished.

Peridural anesthesia is another form of regional anesthesia which is sure to be further developed in chest surgery.

One must not forget that spinal anesthesia has, in many hands, an extensive field in chest surgery. It must be administered with a special technic. A weak solution of procaine must be used because a large volume is required and because one must count upon obtaining sensory anesthesia without motor paralysis. Procaine is the drug of choice because anesthetic doses of others tend to produce more motor paralysis. From 10 c.c. to as much as 15 c.c. of a 2 per cent solution is injected intradurally in the lumbar region. If properly done, satisfactory anesthesia is obtained and the patient can breath and cough as directed by the surgeon. Any type of operation upon the chest wall and even lobectomy can be performed, some surgeons preferring spinal anesthesia above all others for lobectomy. I know of none who is using it for pneumonectomy and I believe it would be impractical.

For limited thoracoplasties some chest surgeons are employing intravenous anesthesia. Although I am very fond of intravenous anesthesia for many purposes I feel that it is not quite suitable for this. The patient is usually on his side and the lower arm is usually compressed at the axilla, interfering with free venous flow. The upper arm is subject to sudden movements with the work of rib resection. This makes it almost impossible to administer the anesthetic into either arm smoothly and certainly enough. If one attempts to use a foot vein he is too far away for good observation of the signs of anesthesia. Another disadvantage is still more important. During operations upon the chest one must have definite control over respiration. In intravenous anesthesia respiration is apt to be greatly subdued and there are no adequate means of control such as accompany local or inhalation methods.

Inhalation anesthesia offers certain advantages over all other types for chest surgery. As Dr. Kinsella suggested, time is unlimited and respiration is under absolute control by the anesthetist. The patient is, of course, unable to cough out secretions as he can do under spinal and local anesthesia but the anesthetist can keep the bronchi clear by aspiration. In order that lung movement and ventilation can be perfectly controlled and secretions cleared away, inhalation anesthesia for all chest surgery, except quite limited procedures upon the chest wall, should be administered through an intratracheal tube. At the University Hospital for several months we have introduced all intratracheal tubes under intravenous anesthesia, thus saving the patient and anesthetist a long gas-ether induction.

We have found this very satisfactory from all standpoints. Anesthesia is then maintained by inhalation through the tube. There has been some general discussion, of course, regarding the propriety of introducing a tube into the trachea in cases of tuberculosis, the fear being that the irritation might tend to light up an infectious process. The obvious advantages are much greater than any theoretical disadvantages and have been generally recognized as such. With this technic, anesthesia can be safely conducted and operation carried on, even with the chest open, for a longer period of time than in almost any other type of surgical procedure. Cyclopropane is the inhalation anesthetic of choice for this work. There are no others which compare with it in value for chest surgery. The advantage of high oxygen and ability to carry the anesthesia with quick changes from light to deep and deep to light according to the needs of the situation are all there and all should be taken advantage of. At the close of the anesthetic a thorough "tracheo-bronchial toilet" should be carried out by aspiration with a catheter through the tracheal tube and the anesthetist should then inflate the lungs with air to replace the rapidly absorbable oxygen and anesthetic gas. The bag should be emptied and refilled with air several times and bag-pressure of 12 mm. mercury applied intermittently during each inspiration. The aspiration and air inflation are the best safeguards against the danger of atelectasis.

PRESENT STATUS OF GALLBLADDER SURGERY

A. A. Zierold, M.D.
Minneapolis

During the past ten years, a tremendous volume of literature has been published concerning the gallbladder and the biliary tract. A relatively small amount of this has dealt with the surgery of this region, but notwithstanding, a sufficient discussion has developed to establish some definite departures from the previously accepted doctrines.

Largely through the efforts of Andrews and his associates, the concept of gallbladder disease under the term "cholecystitis" has been subjected to careful inquiry.

A review of the published experimental and clinical investigations fails to disclose sufficient evidence to state that cholecystitis is bacterial in origin. The status of the theory may be summarized as follows:

1. Bacteria are seldom found in the gallbladder wall or content.
2. Microscopic studies are not characteristic of bacterial invasion elsewhere.
3. Experimental cholecystitis cannot be produced except occasionally by overwhelming doses of bacteria.

On the contrary, the characteristic changes of cholecystitis can be produced by chemicals and foreign bodies. The evidence at the present time seems to indicate that cholecystitis is not primarily a bacterial disease.

That this conclusion is generally accepted may be inferred by the infrequent mention of the gallbladder as a focus of infection and the abandoning of the idea that it is a sequel to appendicitis or a forerunner of pancreatitis or peptic ulcer.

Further corroboration is to be found in the work done relative to the formation of gallstones. Boyden's demonstration of bile stasis in pregnancy and the investigation of Abrahamson, Neumann, Walsh and others show beyond reasonable doubt that infection is quite unnecessary or at most incidental in the development of cholelithiasis.

As a result of this changing concept of gallbladder disease and also as the result of more careful postoperative surveys, the prevailing opinion amongst surgeons here and abroad is that operations upon the gallbladder are rarely necessary unless stones are present.

Lahey contends that every patient having stones in the gallbladder with or without symptoms should be subjected to cholecystectomy on the grounds that in so doing the incidence of common duct stone will be lowered. Opposed to this extreme view are Andrews, Foss, Graham, Stanton and others who feel that only the stone-bearing gallbladder which gives definite symptoms should be a candidate for operation, and cite a mortality of 1 per cent in all untreated cholelithiasis in the registration area.

Lahey also maintains that of the cases coming to operation for gallbladder disease, 50 per cent will require exploration of the common duct. The reports of Best, Pool, Sweet and others tend to support this belief, but this by no means represents a majority opinion.

A compromise, however, appears to be developing through the more general use of the cholangiogram. In 1932 Mirizzi suggested cholangiography with lipiodol, and in 1936 Robbins and Hermanson proposed the use of hippuran. Since this time, the procedure has been popularized by Walters, Mixter, Best and many others. At the present time, the prevailing practice may be summarized as follows:

When a patient is operated upon for gallbladder disease, the common duct for at least a short distance is exposed and examined. If it is found to be dilated, one of two courses may be followed. The bile may be aspirated by needle and examined. If abnormal in any respect, the common duct is then opened, explored and drained. An alternate procedure is to inject a radiopaque substance directly into the common duct either through a sectioned cystic duct or through the common duct wall by means of a needle and obtain a cholangiogram at the operating table. This technic appears to be the more popular not only in identifying common duct stone or obstruction preliminary to choledochotomy, but for the purpose of demonstrating residual stones after operation.

Paralleling the development of cholangiography and on the basis of investigations by Boyden, Ivy, Westphal and other physiologists, is the rise of a considerable interest in the so-called choledochus sphincter dyskinesia. It has been shown that spasm of the sphincter of Oddi may not only be of sufficient degree to cause pain, but also to the point where reflux jaundice and liver damage occur.

Walters and others have shown that such spasm may be responsible for the occasional colic following cholecystectomy or choledochotomy. It has also been shown that sphincter spasm is relieved by nitrites but augmented by morphine.

Best puts this phenomenon to further use in an attempt to flush out the biliary tract by first employing desoxycholic acid to raise the intra-ductal pressure and then suddenly releasing it by the administration of nitrites. Colp has devised an instrument for intraductal section of the sphincter, while Bakes, Allen and others prefer forcible dilatation with bougies. These technics, while simple in conception, are not so simple in practice, and as yet are not in common use.

It would appear from the knowledge gained thus far that cholangiography is a valuable, safe adjunct to surgery and that preliminary investigation of the sphincter mechanism may help to differentiate gall bladder disease from sphincter or common duct derangement.

The case for acute cholecystitis must be considered quite apart from all else, as it is still a battle ground for surgeon, pathologist, physiologist and anatomist. While it is true that the concept of acute cholecystitis is changing, there is at present insufficient evidence, clinical or experimental, to identify it as a bacterial, chemical or foreign body reaction. The modern trend of treatment appears to be based more upon the clinical behavior of the organ than upon its pathologic picture. Bergh's recent review of the literature illustrates very well the existing confusion.

The most that can be said is that acute cholecystitis is being treated by competent surgeons in one of three ways: (1) immediate cholecystectomy; (2) early cholecystectomy; (3) late or interval cholecystectomy. The published mortality tables are not sufficiently comprehensive to validate any one procedure to the exclusion of others.

In all the foregoing phases of biliary tract disease, jaundice is a not infrequent complication. It is not within the scope of this discussion to consider this phenomenon except as it affects surgical practice. The prolonged bleeding time in the severe grades of jaundice has recently been investigated with some gratifying results. Ivy, Ravdin, Greene, Snell and others have demonstrated conclusively that calcium deficiency has no relation to the bleeding tendency. Following Quick's discovery of a method for determining prothrombin, Almquist and Stockstad in this country and Dam and Schonheyder in Denmark identified prothrombin alteration with vitamin K deficiency. Ivy also found that the prothrombin level could be restored by large doses of viosterol. As a result of this work, the hemorrhagic tendency of jaundice has been brought under control and the fear of post-operative bleeding is no longer a deterrent to surgery. To measure bleeding time more accurately and provide a better index of operability, Ivy devised a method which to the present date is satisfactory for both clinical and experimental purposes.

In summarizing this brief review, little remains except to emphasize the slow but apparent change in the concept of gallbladder disease, and the importance of the duct sphincter mechanism as demonstrated by newer methods of study.

Discussion

Dr. E. A. Regnier: The essayists this evening have made their papers so inclusive that very little is left to be said on the subject. The impression that one gathers after listening to Dr. Zierold's presentation is that we have about as much latitude in gallbladder surgery today as we had twenty-five years ago. Many phases of the subject are still rather controversial, hence every case must be individualized.

One phase of gallbladder disease, namely acute cholecystitis, must be brought to your close attention. We must keep in mind that acute cholecystitis in the first twenty-four to thirty-six hours of its development is not an acute suppurative process. Sections made from these tissues show few if any bacteria in the gallbladder wall; likewise, few bacteria in the contents of the gallbladder. It is generally recognized that the first stage of this inflammatory process follows obstruction of the cystic duct. After thirty-six hours, or thereabouts, an acute suppurative process usually develops and subsequently there is a certain amount of hepatitis adjacent to the gallbladder.

Some men looked upon the early changes in acute cholecystitis is an allergic phenomenon. I believe that this is a new avenue of approach to common-duct surgery.

The jaundiced patient, together with the variations and alternations in the bleeding and clotting time of blood in these patients is a problem that can be best met or solved by the use of frequent blood transfusions to replenish the prothrombin in the blood stream. When synthetic vitamin K is generally available its use may obviate the necessity of blood transfusion.

RECENT ADVANCES IN SURGERY OF THE ABDOMEN AND ABDOMINAL WALL

Stanley R. Maxeiner, M.D.

Minneapolis

I have tried to go over some of the more recent reports of subjects that have been particularly interesting to me and it is quite obvious that it is impossible to cover everything that has been brought out in the literature.

The first thing that I have chosen to speak about is disruption of the abdominal wall, which is one of the ever-present worries of the general surgeon. It is of universal concern because it occurs in every general service in every hospital. It occurs unexpectedly and carries with it a very high mortality.

Grace[1] reports thirty-six cases with protrusions of the abdominal viscera and ten without protrusion of the viscera. It occurs at all ages from very young infants to the very aged. An analysis of these cases showed:

	Cases
Split right rectus, upper	28
Split left rectus, upper	8
Median epigastric	3
Split rectus, lower	3
Reversed Kammerer	2
Transverse	1
Median suprapubic	1
Total	46

Thirty-nine of the forty-six disruptions occurred in upper abdominal incisions. In their cases the majority of eviscerations occurred following operations for carcinoma, chronic ulcer, gallbladder disease and appendicitis. This suggests, at least, delayed healing in debilitated, run down individuals. Indirect causes listed by Grace were as follows:

	Cases
Infection	17
Coughing (pneumonia, 5 cases)	17
Vomiting	9
Distention or obstruction	4
Hiccoughing	4
Retching at lavage	2
Difficult sew-up	2
Patient getting out of bed	3
Not known	3

Infection, coughing, vomiting and distention were postoperative complications which occurred in forty-seven of their cases. Disruption may occur any time from the second to the fourteenth day or even later, but the majority of their series occurred between the fifth and tenth days.

Pink staining of the dressings accompanied by a watery discharge of peritoneal fluid may be one of the earliest symptoms, and as separation progresses, evisceration occurs. Secondary suture was employed in thirty cases and packing or strapping in sixteen. Where protrusion of the abdominal viscera occurred, the mortality was 41 per cent, but where evisceration did not occur, the mortality was 30 per cent.

William Crawford White[4] states that they have had no eviscerations in the intramuscular, Pfannenstiel or transverse incisions but disruption is essentially confined to midline, split rectus and the laterally retracted rectus incisions. In their series of eviscerations the mortality was 53 per cent. He believes there is a definite failure of healing in the aged, the decrepit, the malignant and the jaundiced due to inanition. He finds cough, distention and infection to be definite exciting causes but likewise believes that early absorption of catgut is an extremely important factor. Debilitated patients are being closed by through-and-through silk sutures put closely together and their disrupted wounds are being closed by the same method.

Isidor Kross,[3] in a review of 4,433 operations at Beth Israel Hospital, found occurrence of eviscerations to be just over 1 per cent. Sex and age were of no importance. He states that the theories generally advanced are: (1) failure of the suture material; (2) unusual strains; (3) constitutional factors and debility causing a failure of the wound healing processes; and (4) wound infection. He refers to the studies of wound healing made by Meleny and Howes, who divide the healing process into two stages: (1) the exudative, which lasts four or five days; and (2) the reparative stage, beginning at the end of the first stage and continuing until wound healing is complete.

In the first period an exudate develops which depends upon the number of injured cells, the amount of extravasated blood and lymph, bacteria in the wound and the amount of suture material employed. During this period the tensile strength of catgut sutures diminishes rapidly. As the exudate undergoes absorption, fibroplasia takes place with the formation of new scar tissue and a progressive increase in the strength of the wound. Tissue necrosis, hemorrhage, infection and debility delay the reparative processes. Freeman and King believe that an incomplete closure of the peritoneum permits a bulging of omentum or loop of intestine which, acting as a wedge, forces the tissues apart and eventually breaks through the skin. This factor is supported by the appearance of the edges of eviscerated wounds inasmuch as only the most recent part to separate is found to be bleeding. The other surfaces are gray, covered with exudate and do not present the appearance of being freshly torn apart.

Dr. Ralph Knight,[2] of our own Society, referred to reports by Sokolov, Willard Bartlett, Max Thorek and others, and reported four interesting cases of his own.

Practically all writers agree that catgut is not to be depended upon, that during the exudative period it rapidly decreases in strength and, in many individuals, absorbs before healing has taken place. The literature abounds in case reports in which, at the time of resuture of disrupted wounds, catgut with no tensile strength is found in the tissues.

William Hinton suggests allergy for an explanation of wound separation and incisional hernia. Decline in the strength of catgut after exposure to living tissue has been investigated by Rhoads. Implantation of several makes in the abdominal walls of dogs showed that the tannic iodized type presents substantially more resistance to tissue fluids than medium hard chromic catgut and is less acted upon by infection.

Fallis of the Henry Ford Hospital reports fifty disruptions to have occurred in 7,903 laparotomies. They perform immediate secondary closure with a mortality of 34 per cent.

From the foregoing it is obvious that wounds disrupt after closure with any type of suture. However, practically all essayists agree that catgut alone is not reliable. Even when tension sutures are used they may cut through the tissue and permit evisceration. However, if there is any lesson to be gained from the above it must be that in certain groups of cases where wound security is questionable one should exert every possible effort to prevent this dire complication.

A great deal of study has been going on in the last few years relative to the development of new and better sutures. C. J. Kraissl recommends some way of dispensing catgut other than the narrow glass tubes, which he believes kinks and weakens the strands. He also believes that during the absorption of the protein in catgut, the metals and halogens it contains are liberated and cause irritation which may interfere with wound healing. He believes this is particularly true of chromium, to which certain individuals may be sensitive. He states that it is possible to sensitize guinea pigs to catgut so as to produce disruptions in laparotomies sutured with this material. He also says, "The highest incidence of sensitivity was a group in which wound disruption had occurred and all allergic patients who had disrupted exhibited a sensitivity to one or more antigens." He suggests preoperative testing of individuals by appropriate skin tests before using catgut for abdominal closure.

Shambaugh and Dunphy state that postoperative infection in contaminated wounds occurs less frequently when fine silk is employed. They believe that silk is much less irritating. They also used contaminated catgut and silk to close wounds in experimental animals. Their conclusions were that wounds thus infected healed better with silk than with catgut.

We have all experienced slowly healing sinuses in abdominal incisions which healed rapidly after the removal of a chromic knot. The essayist, twenty-five years ago, went through the stage of nonabsorbable suture, at which time it was necessary to use fine fish line in order to get silk with adequate tensile strength. Silver wire filigree was often used to reinforce incisional defects but in most instances these gross foreign bodies had to be removed.

Clifford Collins and J. Bellas, in a paper to be presented before the Western Surgical Association in December, state, "The ideal suture must be one that is non-reacting, one that is not affected by the enzymatic, chemical, physiologic, bacteriologic and physical influences such as occur in the body tissues and hence one that does not interfere with prompt, normal repair. Such an accomplishment is believed to have been attained in a new suture called platisgut on the basis of extensive animal and clinical experience."

Regarding carbon dioxide inhalation during closure of the abdomen, it would appear that there is still considerable controversy concerning its value. Thomas Ryan, Philadelphia, states, "It would appear that carbon dioxide is of no value in prevention of postoperative pneumonia." This is based on two series of patients in which 2.2 per cent of pulmonary complications developed following the use of carbon dioxide and 1.4 per cent complications in a similar group of cases where carbon dioxide gas was not used. These statements, however, are not conclusive and undoubtedly will not check with the findings of many others.

Roscoe Graham points out, "The surgeons' responsibility in the treatment of duodenal ulcer is to patients suffering from complicated ulcer, penetration, obstruction, recurrent hemorrhage or perforation." Treatment must result in the absence or decrease of free hydrochloric acid in the gastric contents. Gastroenterostomy should be reserved for scar stenosis and low free hydrochloric acid, and for elderly patients with penetrating nonobstructing ulcers but with low free hydrochloric acid in the gastric contents. All other patients should be treated with radical subtotal gastrectomy. In the treatment of acute perforation in duodenal ulcer, simple closure is all that is indicated.

Leon Goldman states that the mortality from bleeding ulcer is much higher than previously supposed. Repeated hemorrhage shows a rising mortality and surgery should be considered in view of intractable medical treatment.

Graham, Kalk, Strauss, Berg and others indicate a definite swing to the more radical gastrectomy. The Billroth I type of resection does not lend itself to the same successful results as the more radical Billroth II or the Polya type of resection.

Smith and d'Abreu of London recommend the anterior incision of the duodenum and suture of the posterior duodenal ulcer to control hemorrhage, while Hans Finsterer of Vienna is strong for the more radical type of operation. Finsterer states that when operation can be performed at the onset of hemorrhage or at least within twenty-four to forty-eight hours, satisfactory results can be expected with a very low mortality. On the other hand, the results of late operation for hemorrhage are bad, having had sixteen deaths in fifty-three resections. In forty-four resections following chronic hemorrhage, there were but two deaths.

While Berg and Strauss claim a larger percentage of marginal ulcers following gastro-enterostomy, the results claimed by the Mayo Clinic are much lower and gastro-enterostomy still has its definite indications.

Still states that of 105 patients on whom partial gastrectomy was performed for gastric ulcer, 103 were able to do hard work without restrictions of diet, and of 236 resections for duodenal ulcer, 223 were cured. Following 292 gastric resections there was only one gastrojejunal ulcer.

Lake reports 65 partial gastrectomies with immediate mortality of 6.3 per cent with 89.8 per cent satisfactory results. Berg, from the Mount Sinai Hospital, records 401 primary resections for gastric and duodenal ulcers with mortality of 6.9 per cent. Among 516 cases of primary and secondary gastrectomy he reports only six cases of possible recurrence, an incidence of 1.1 per cent.

Jennings reported a new and successful method of total gastrectomy in which the jejunum is sutured to the diaphragm and the ligated, cut-off end of the esophagus, which is free from the peritoneum, is introduced through the wall of the jejunum so that healing takes place between the jejunum and the diaphragm. Dr. Wangensteen of our Society has proposed a similar new technic for total gastrectomy performed in two stages.

H. B. Sprung reports the end-results of 464 resections of the stomach for cancer. The mortality in the aged was 31 per cent while only 4 per cent in young subjects. The majority of deaths were caused by peritonitis or pulmonary complications. Three hundred twenty-five lived over one year, 233 over five years and 102 over fifteen years.

Gatewood has repeatedly called attention to the fact that the poor results from resection of gastric cancer is in part due to the pessimistic attitude of the doctor who is frequently to blame for the fact that the average patient does not report to the surgeon for operation for months following his first diagnosis of carcinoma.

I wish only to call attention to the work of Best and Hicken on the treatment of stones remaining in the common duct following surgery. Irrigation of the common duct through a T-tube with ether and alcohol, normal salt solution and oils, together with the use of antispasmodics such as atropin, glyceryl trinitrate, etc., will frequently empty the common duct of its remaining stones. A recent case of our own treated by this technic has responded readily with rapid emptying of the common duct as shown by visualization through the use of opaque media.

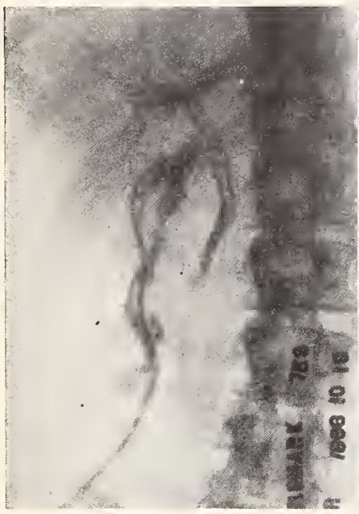

Fig. 1.

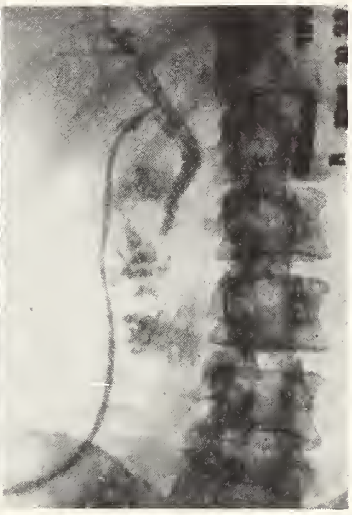

Fig. 2.

Fig. 1. Injection of the T-tube in the common duct with diodrast, six days post-operative. The ampulla is completely closed. The arrows mark negative shadows interpreted as small stones but which we believe to be air. Most of the injected solution follows out the sinus. The patient had gross symptoms of malaise, lack of appetite and general lack of well-being from the absence of bile, together with chalky stools.

Fig. 2. Through the T-tube the common duct was irrigated with ether, normal salt solution and oil, and the patient was given atropin, sedatives and glyceryl trinitrate for ten days. All drainage of bile around the tube stopped. Injection with diodrast showed the ampulla open and the dye passing directly into the duodenum. The T-tube was immediately removed without further biliary drainage after twenty-four hours.

The patient, aged forty-five, was operated upon for cholelithiasis. The gallbladder contained many small stones. The common duct was explored and found to contain numerous small stones and mud. A probe was passed through into the duodenum and the duct was thoroughly washed out with salt solution.

The operation which Lahey described before this Society for exteriorization of the right colon and anastomosis between the small bowel and transverse colon after the technic of Mikulicz is a great step forward and has greatly reduced the mortality and morbidity in handling carcinoma of the right colon. The double barrel colostomy of Lavine through which the distal colon may be irrigated and cleansed of infection will greatly reduce the mortality of resections of the distal colon, particularly for inflammatory disease such as diverticular tumor where the distal segment may be allowed to remain for a long time and to be almost completely sterilized. The similar operation as proposed by Lahey and Cotrell for sterilization of the rectum before the second stage resection has been extremely successful in our hands and I believe unquestionably will lower the mortality for radical resection for carcinoma of the rectum.

Rankin states that in the past three years he has found it advantageous in handling cancer of the rectum to adopt the following definite proposals.

1 He has abandoned intraperitoneal vaccination.
2 He has eliminated spinal as routine anesthesia.
3 He has extended preparation to at least seven days.
4 He has instituted routine presacral neurectomy.
5 He uses postoperative blood transfusions routinely.
6 He has adopted wider use of the single stage abdomino-perineal resection. Rankin concludes that there is no doubt but what there are cases in which it is advantageous to use the two-stage radical maneuver, and furthermore there are many cases in which it is unwise to employ either of these radical procedures in which operation may be undertaken by colostomy and posterior resection.

Gabriel of St. Mark's Hospital, London, reports an operative mortality of 7 per cent, which is almost identical with Rankin's 7.7 per cent. He also reports a 52 per cent five-year survival for all groups and all types combined.

With reference to Rankin's statement regarding presacral neurectomy we believe that this not too difficult procedure is a very definite step forward in the relief of chronic pelvic pain, especially that associated with certain types of malignancy. During the past year we had a patient complaining of almost intolerable pain in the pelvis following four pelvic laparotomies because of inflammatory disease of the tubes and cystic disease of the ovaries. In her last pelvic laparotomy performed by us, hysterectomy and presacral neurectomy were performed, following which the patient has had complete relief from pain.

Fallis reports 1,600 consecutive operations at the Henry Ford Hospital for hernia with a recurrence rate of 8.25 per cent, 7.4 per cent for indirect hernia and 11.6 per cent for direct hernia. They stress particularly in direct hernia, repair and reinforcement of Hesselbach's triangle. In the direct hernia it is important to repair the transversalis fascia. Bilateral operations show a definite increase in postoperative complications and in the recurrence rate. In the repair of direct hernias, large indirect hernias and recurrent hernias, together with large postoperative ventral hernias, the ordinary catgut closure is grossly inadequate and is followed by a large percentage of failure. In these patients we strongly advocate some more secure means of closure, such as the use of the McArthur strip in the inguinal hernia or the use of fascia lata after the technic of Gallie. With the more recent advances in sterilization and operating room technic and the vastly improved tensile strength of fine braided silk, we have personally experienced a very definite swing toward its substitution for catgut.

Dr. Culligan, a member of this Society, in a recent paper reported a 56 per cent reduction of recurrences in direct inguinal hernia by the use of some type of fascial suture. In most instances the McArthur technic was employed, paying particular attention to suture of the transversalis fascia.

We recently performed secondary cholecystectomy for recurrent empyema of the gallbladder with chronically infected sinus and postoperative incisional hernia. We were certain that, with extensive suppuration, catgut could not be relied upon and adopted the procedure of Babcock and others, of closing the abdominal wall with steel wire. Suppuration was marked as anticipated, the wound held securely and the wire has become firmly incorporated as evidenced by x-ray examination.

There has been a definite return of the Ochsner method in the treatment of late cases of appendicitis. I believe that this is a step forward and is due to the excellent teachings of Dr. Wangensteen as fostered at the University Hospital.

Intestinal decompression by continuous suction has become extremely popular. The modified Miller Abbott tube, which consists of two small tubes lying side by side through one of which a small balloon may be distended, aids the passage of the tube through the small intestine and intubates a much lower level. Many patients may be tided over without surgery and those with definite mechanical obstruction are often improved to the point that surgery is rendered much more safe.

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Discussion

Dr. Arthur F. Bratrud: Dr. Maxeiner has covered so many phases of this subject so completely that it is practically impossible to add anything. However, there are a few things that might be mentioned, in regard to some of the newer advances in surgery. Dr. Maxeiner spoke about the plastic repair in hernias. In looking over the literature, you may have read a few articles where "cold water" is being thrown upon the plastic repair of hernias, that the recurrence rate is higher where plastic repair is performed than where it is not performed. I am going to read just a short statement that was made in 1890 by Halstead in referring to Dr. Bull and speaking of hernias at that time. Hernia surgery really began about 1880, and in 1890 here is the statement he made: "That ten years have elapsed since the modern radical operation for inguinal hernia has been in vogue, we ought to have presented to us patients who have been more than five years at the least without relapse. We could naturally expect to see such cases occasionally, but there are none such."

I think that may be the attitude a good many men are taking toward the newer advances in surgery, and especially toward plastic repair in hernias. I have had some interesting experience as far as fascial proliferation is concerned. Quite a number of years ago, in suppurative abdominal cases, I began closing these patients with just strips of adhesive tape. The peritoneum was sutured, but nothing else was sutured, and it is interesting to note what happened. Most of those patients healed by primary union in about two weeks. There was no suppuration in the wound or fascia with very little separation of fascia. Occasionally a patient would develop a hernia and I thought that by taking a forceps and clamping across the edge of the cut fascia so as to hold the edges together, without any suture but by leaving the clamps on for two days, that hernia could be prevented. What happened was this: Those wounds all became infected, due undoubtedly to the trauma produced by the clamping of the forceps across the fascia, and the fascia sloughed. With the patients who did not have the clamp put on, a very interesting fact was observed when they came to operation if a hernia had resulted. Instead of the fascia coming out to a point in a "v" shaped manner, being very thin at the margin, it was thick and round, a good deal like the shape of a pear, so that the closure of those hernias was very easy. All that was necessary to repair the hernia was to split the fascia, because there was so much proliferation and thickening of the fascia.

I think that brings up the very interesting observation as far as the plastic repair of hernia is concerned. Usually when we take the fascial strips, a clamp is fastened across the fascia before the stripper is put on. This does definitely traumatize the fascia and traumatized fascia is more liable to become infected. I think that we all make a mistake when we do not cut off that traumatized area before we attach the silk suture and attach the fascia in the wound, in plastic repair of hernia, because it undoubtedly is a predisposing factor toward inducing infection in that wound. Infection is one of the complaints of most of the men who have been doing fascial transplants. The high incidence of infection in these plastic repairs of hernia is undoubtedly the cause of the high recurrence that is being reported. Fascia properly handled and used in a transplant does remain viable and does not atrophy and absorb, as stated by some surgeons. While doing peripheral nerve surgery in the Army I had the opportunity to operate in cases where fat fascia transplants had been placed around the nerve suture line, as many as three years previously, and the fascia had not absorbed.

I have always been rather in favor of silk suture of wounds. I have made the statement at the hospital a number of times to the internes, that I would like to see ten patients in whom catgut is used and ten in whom silk is used. I could then send any interne down through a ward and he would be able to pick out the ten patients in whom silk had been used and the ten in whom catgut had been used. You can do that very easily because there is an induration and thickening in the tissues following the use of catgut, whereas with silk there is a very nice soft wound. Anybody can pick out the cases that have been operated upon with fine silk. That simply confirms the observation made by some men connected with the Chicago University in regard to wound healing, and also recently emphasized by Whipple (I believe one of the last articles was in Annals of Surgery), that you get more exudate in wounds where plain catgut is used than where you use chromic catgut. Chromic catgut produces more exudate in wounds than silk does. In other words, there is apparently some allergic factor in or irritation from the catgut that produces excessive exudate, and Whipple also goes on to show where you have used catgut you have a certain amount of necrosis around the suture line, around the catgut, with either plain catgut or chromic.

I think Dr. Maxeiner brought out a very interesting thing in the case cited in regard to presacral neurectomy, which is a wonderful thing. You may remember a number of years ago where, when we had severe cases of dysmenorrhea, we used to do the ordinary Pozzi operation. Occasionally we would get a result, but in most cases we would not. There probably were as many good results with the ordinary dilatation and curettage, as resulted with the Pozzi operation. I believe the case that Dr. Maxeiner illustrated is a wonderful thing, because it brings out the importance of presacral neurectomy in some of these cases of intractable pain in the pelvis. I understand now that with some of these tuberculous bladders, irritable bladders, etc., they are getting wonderful results with presacral neurectomies.

PRESENT STATUS AND MODERN ADVANCES IN THE SURGERY OF THE KIDNEY AND BLADDER

C. D. Creevy, M.D.
Minneapolis

Perhaps I ought to begin by apologizing because about two-thirds of my remarks have to do with the medical rather than with the surgical aspect of urology, since many recent advances have been of a medical nature.

The first development which deserves comment is a diagnostic procedure which has been one of the most useful contributions to medicine in many years, namely excretory or intravenous urography, which was introduced by Swick and Von Lichtenberg in 1929. In its present form it will give adequate and satisfactory information about the form and function of the kidneys in somewhere between 70 and 80 per cent of the cases. If it does nothing more than reduce the necessity for cystoscopic examination by a large percentage it is well worth while from the humanitarian point of view alone. It has reduced the number of cystoscopic examinations and retrograde pyelograms to the extent that in the average case it is necessary to resort to cystoscopy in the study of lesions of the kidney only to settle certain details.

Failures are due either to impairment of renal function or (and this is more often the case in ordinary circumstances) to technical blunders in connection with the timing of the films and with their proper exposure.

Any discussion of therapeutic advances reminds us that this is an age of great enthusiasm for the hormones, and urology has been affected as much as any other specialty. I think that much of this enthusiasm will subside in time, but that remains to be seen. The anterior pituitary and the anterior pituitary-like hormones are now widely used in impotence and in aspermia on the assumption that they stimulate the interstitial cells of the testes to produce testosterone, and the germinal epithelium to produce sperm. There is very definite experimental evidence showing that they do stimulate the elaboration of testosterone, but whether they produce spermatogenesis is open to doubt.

As you know, the anterior pituitary-like hormone has also been widely used to induce descent of the undescended testicle. The preparation was first used clinically by Shapiro in 1930 and has since been rather generally adopted.

Thompson and Heckel among others have made the interesting observation that it is possible, with sufficient dosage over a sufficiently long period of time, to induce hypertrophy of the male external genitalia, including the penis. They have suggested its use in children with hypospadias to increase the size of the penis in order to facilitate operation. Personally I see no objection to waiting until nature produces the enlargement, as she almost invariably will, since the results of operation are as good in the adult as in the child. Apparently there are no ill effects, since the changes produced, with the exception of descent of the testes, disappear shortly after the administration of the drug is discontinued. The exact value of anterior pituitary-like hormone in failure of descent of the testes is pretty hard to estimate because reports of success in the literature range from 25 to 90 per cent. Those reporting lower percentages are inclined to suspect that the very good reports result from the confusion of physiological ectopy with true failure of descent. In the former, spasm of the cremaster muscle holds the testis in the region of the external ring and there is actually no congenital anomaly requiring correction.

Second in present popularity are the testicular hormones. These are divided at the present time into two main groups, the fat-soluble hormones said to come from the interstitial cells and called generally testosterone (andosterone if it is recovered from the urine). It is recommended in hypogonadism in which the testes are very badly damaged or absent. If testes are present and apparently normal or small, anterior pituitary-like hormone is recommended in order to stimulate these testes, whereas if there appears to be no possibility of stimulating the growth and spermatogenesis of the testes, testosterone appears to be preferable. Its successful use in eunuchs has recently been reported both in the medical and in the lay press by Vest and others in Baltimore.

The fat-soluble testicular hormone testosterone is also recommended in prostatic hypertrophy. Its use here is based upon the assumption that in the normal male both estrogenic and androgenic hormones are present, and that with advancing years there is a diminution in the production of male hormone with a relative but not an absolute increase in the estrogens. This idea has originated from the fact that experimentally one can produce a type of prostatic hypertrophy quite unlike that seen clinically, by the administration of estrogens. It is thought to counterbalance this relative excess of estrogen by the administration of the fat-soluble hormone.

We have had a fairly considerable experience with testosterone in prostatism at the University Hospital, and it is my opinion, after treating some thirty or thirty-five cases, that it is probably a form of psychotherapy, but that needs to be verified.

There is a second hypothetical testicular hormone which also has been recommended for prostatic hypertrophy by Lower and his group. It is said to be the water-soluble hormone of the germinal epithelium and is called by him inhibin. Its function is said to be to hold the anterior pituitary in check and to prevent hypersecretion, since it has been shown experimentally that the administration of anterior pituitary or anterior pituitary-like substances to the experimental animal may induce prostatic hypertrophy. He has undertaken to administer this hypotheical hormone by feeding patients dried testicular substance, and has maintained that some 45 per cent of those treated have been very distinctly benefited. By none of these hormones is it possible to reduce the residual urine or to change the size of the prostate, *i.e.*, the improvement is functional.

And now something about urinary antiseptics. I suppose the modern era of urinary antisepsis can be said to have started with the administration of the ketogenic diet for sterilization of infected urine. Its use was based upon the observation at the Mayo Clinic that an unsterile bottle of urine from an epileptic patient who had been kept on a ketogenic diet had been mislaid in one of the examining rooms and had kept fresh and free from odor for four or five days. Since it had not been collected with sterile precautions it was evident that there was something very unusual about this urine. Investigation showed that it contained ketone bodies. This was immediately and successfully employed in infections of the urinary tract by Clark, Helmholtz and others. Fuller subsequently showed that success was due to the presence in the urine of betahydroxy butyric acid, which, for optimum results, should reach a concentration between 0.5 and 1 per cent at a pH of 5.5 or below.

This method of urinary antisepsis is most effective against Gram-negative bacilli. It is an exteremely unpleasant business for the patient. It is difficult to take, and the diet must be controlled absolutely or no ketosis is produced. For that reason, everyone was pleased when Rosenheim, in a search for a stable but effective substitute for betahydroxy butyric acid, found that mandelic acid was not changed in the body, was excreted in the urine, and had about the same antiseptic properties under the same conditions as had the ketogenic diet. It was distinctly less difficult to take. Mandelic acid must also reach a concentration in the urine of between 0.5 and 1 per cent at a pH of 5.5 or below, and it has its best effect in infections with Gram-negative rods and the Streptococcus fecalis.

One or two of you may have heard of the third modern urinary antiseptic which is known as sulphanilimide, and may know something about its history. It was apparently first applied to infections in the urinary tract by Colebrook and Kenney in England, and since has been very widely used in this country. It was apparently first used for gonorrhea by Dees and Colston in Baltimore, and has since been employed by practically every physician in the United States and probably also in Europe. It appears to be effective under favorable conditions in infection of the urinary tract by almost any type of organism except the Streptococcus fecalis. One of the strong points in its favor is that it will sometimes actually sterilize the urine in the presence of Bacillus proteus, something which has hitherto been impossible of accomplishment by any other means. No one, of course, can estimate its exact place in therapy but I don't think anyone can deny that two of the outstanding advances in combating infections in the urinary tract and the genital tract as well, have been the introduction of mandelic acid and of sulphanilimide.

A word about urinary lithiasis. Higgins has applied the previous experimental work of others on rats to the human, and has concluded that, in the human as well as in the rat, urinary stones result from deficiency of vitamin A, which, among other things, produces an alkaline urine and encourages the development of infection. He has undertaken to treat and says that he has been able to dissolve a number of stones in the kidneys by the administration of a high vitamin acid ash diet. Apparently he doesn't believe in taking chances because he doesn't confine himself to the administration of vitamin A but includes B, C, D and a few others for good measure and keeps the pH of the urine below 5.5. He alone, so far as I know, has been able to cause the dissolution of renal stones by this method, which is probably of value chiefly in preventing the recurrence of stones after operation rather than in dissolving stones already formed.

Another thing that may be an advance in connection with lithiasis is an increasing appreciation of the rôle of bacteria, not so much in the production of primary stones as in the production of recurrences following operation. Chief offenders are the urea splitters, of which Bacillus proteus is the worst; staphylococci and other organisms may split urea, produce alkaline urine, and lead to stone formation.

And now a word or two about surgery, since this is a surgical society. One can dismiss the subject of the kidney by saying that recent times have witnessed wider application of conservative operations. The operations themselves, particularly the plastic procedures upon the ureteropelvic junction for hydronephrosis, are not new. Present practice tends to the more frequent removal of stones from the kidney rather than to the removal of the kidney whenever it seems at all likely that the kidney can be saved.

I suppose that division of the isthmus of the horseshoe kidney ought to be mentioned as a recent advance. Although the operation was first done by Rovsing many years ago, it has only recently come into use in this country.

In the surgery of the prostate the outstanding advance has of course been the widespread use and improvement of the operation of transurethral resection, whether by the so-called cold punch or by the diathermy loop. While no one has yet been able to decide just how widely the operation ought to be applied, I think that depends largely upon the ability and the inclination of the individual surgeons. Certainly there is no question but that some 98 per cent of all prostatic obstructions *can* be relieved by transurethral resection. Whether it *should* be applied to 98 per cent is another question. That will depend, of course, upon the late results. As now done by experienced operators, transurethral resection is very nearly as complete an operation as prostatectomy and is applicable to all except the very largest glands and in those cases in which urethral stricture prevents the introduction of the instrument. It is of very distinct value in carcinoma of the prostate which is inoperable so far as cure is concerned, in that it restores to the patient the ability to urinate normally without the assistance of apparatus. It has the advantage over prostatectomy, whether suprapubic or perineal, of a lower mortality, a shorter hospital stay, and of greater comfort for the patient. It has the disadvantage that it is difficult to secure an opportunity to learn how to do the operation because it is a tricky business and is something like golf in that, if you want to do it well, you must do it frequently.

Surgery of the bladder has been marked by a swing to the use of transurethral methods doubtless under the influence of the results of transurethral resection of the prostate. There has been a distinct increase in the application of litholapaxy, which, until recent years, had fallen into almost complete disuse. There has also been an increasing tendency to apply transurethral methods to the treatment of tumors of the bladder. These methods consist in cystoscopic excision with the diathermy loop, fulguration, and the implantation of radon. They have been supplemented by the more effective use of high voltage x-ray therapy based upon the ideas of Coutard (small, frequent, long continued dosage) so that the total amount of irradiation delivered to the objective is much higher than it was with the older methods of larger doses at less frequent intervals.

One other thing that deserves mention is presacral neurectomy for neurogenic vesical dysfunction with retention of urine. While I have undertaken a very painstaking study of its value, I find myself as uncertain after six operations as I was in the beginning. It has also been recommended in interstitial cystitis, a condition in which, as you know, the submucosa is replaced by scar tissue and the bladder is contracted, irritable and painful. Of the two patients upon whom I have done the operation, one is perfectly certain that she has had very definite benefit although she still comes back every three to six months for over-distention of the bladder, a fact which makes me rather skeptical as to its actual value. There has been no increase in the capacity of the bladder but the amount of pain associated with urination has been very definitely diminished. In the other case there was no apparent change. I have used it once in intractable encrusted cystitis with lasting benefit but not cure.

Discussion

Dr. T. H. Sweetser: I wish to call attention to two matters only: first, I wish to mention two aids in the passage of ureteral calculi. The first of these is the taking of 200 grams of glycerine diluted to a liter with water, and imbibed while in a hot tub bath. It was recommended in 1933 by H. Gissel at Rostock. I have tried it a number of times with varying success. The other aid was described by Jarman and Scott of Rochester, N. Y., in 1937—the injection of a 4 per cent solution of avertin crystals into the renal pelvis and ureter above the calculus. Their method is to insert three or four catheters and bougies and leave them 48 hours before injecting avertin before and during removal of the catheters. I have modified the procedure as follows with success: a ureteral catheter was passed to the renal pelvis beyond the calculus and avertin injected as advised by Jarman and Scott; after fifteen minutes a Johnson stone basket with filiform tip was passed, using the catheter as a guide; the catheter was then removed, the basket was removed, bringing the stone with it. I feel that this modification of the procedure is worthy of further trial.

The second matter of special present interest to me is the use of air cystograms in the study of vesical neck obstructions, especially in the study of difficulties following prostatic surgery. I wish to show some illustrative air cystograms now. I feel that this simple procedure, when considered with the rectal palpation and test of residual urine, gives a surprisingly accurate and graphic demonstration of the conditions present.

Dr. E. L. Meland: I have enjoyed very much listening to Dr. Creevy's presentation in newer developments in urology and, inasmuch as he has covered the field so well, there is not much to add. There are two subjects which he did not touch upon which I would like to mention.

The first is radical perineal prostatectomy for early carcinoma of the prostate. This is an operation which was proposed by Dr. Young as long ago as 1904, so the procedure is not new. However, marked interest has been shown in this subject in the last few years. The operation is only applicable to those cases in which there is a small nodule well contained within the capsule without any evidence of extension outside. Obviously, the number of cases to which the operation can be applied is very small. The opportunities for applying this procedure are dependent upon the early recognition of nodules which may be malignant. An attempt should be made to educate the medical profession in general to the possibilities of radical perineal prostatectomy.

The second subject is on the treatment of a certain small number of cases of prostatitis. A few years ago Dr. Thompson described a new method of dealing with dilated ducts in the prostatic urethra which were, virtually, the internal openings of small sub-urethral abscesses. Where this condition exists the proper treatment will, in many instances, lead to a marked improvement in the existing infection in the prostate and, occasionally, practically the eradication of the infection. Those patients in which there are many local symptoms such as burning and frequency are usually relieved of these symptoms by slitting of the dilated ducts and excision of the overhanging edges. It is possible with this operative procedure to evacuate prostatic calculi when they are present.

BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

Clinical Laboratory Methods and Diagnosis. Second Edition. R. B. H. Gradwohl, M.D., Director of Gradwohl Laboratories and Gradwohl School of Laboratory Technic; Formerly Director of Laboratories, St. Louis County Hospital, et cetera. 1607 pages. Illus. Price, $12.50, cloth. St. Louis: C. V. Mosby Co., 1938.

Synopsis of Clinical Laboratory Methods. W. E. Bray, B.A., M.D., Professor of Clinical Pathology, University of Virginia; Director of Clinical Laboratories, University of Virginia Hospital, et cetera. 408 pages. Illus. Price, $4.50, flexible binding. St. Louis: C. V. Mosby Co., 1938.

Medicine in Modern Society. David Riesman, M.D., Professor of History of Medicine, and Professor Emeritus of Clinical Medicine, Princeton University. 226 pages. Price, $2.50, cloth. Princeton, N. J.: Princeton University Press, 1938.

Maternity Care In a Rural Community. Maxwell E. Lapham, M.D., Assistant Professor of Obstetrics, School of Medicine, Tulane University of Louisiana, et cetera. 65 pages. Illus. Price, 25c, paper cover. New York: The Commonwealth Fund, 41 E. 57th St., 1938.

Drug Addicts Are Human Beings. Henry Smith Williams, M.D., B.Sc., LL.D. 273 pages. Price, $2.50, cloth. Washington, D. C.: Shaw Publishing Co., 1938.

Scarlet Fever. George F. Dick, M.D., D.Sc., Professor of Medicine, University of Chicago; Attending Physician Billings Memorial Hospital; Editor, Dept. of Infectious Diseases, Year Book of General Medicine; and Gladys Henry Dick, M.D., D.Sc. 149 pages. Illus. Price, $2.00, cloth. Chicago: Year Book Publishers, 1938.

THE VITAMINS AND THEIR CLINICAL APPLICATION. By Prof. Dr. W. Stepp and his confrères. Copyrighted by The Vitamin Products Co., Milwaukee, 1938, printed by The Wisconsin Cuneo Press, Inc. Translation by Dr. H. A. H. Bauman of Minneapolis, Minn.

Dr. Bauman is to be congratulated upon his excellent translation of this original compilation in the German, dated Munich-Wiesbaden early 1936, by Stepp, Kühnau and Schroeder. It is a very opportune time for a review of the subject of vitamins. Presently the American Medical Association has had weekly articles since early February, 1938. These articles are highly repetitive, and one gleans from the accompanying bibliography the enormous amount of research or printed matter that is appearing in terms of nutrition and protective elements. The fact that Bauman's translation

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has been brought to the attention of the profession through one of the manufacturers of vitamins may possibly cause many physicians to neglect and pass up this work as just another sales promoting leaflet. The work put into this translation by Dr. Bauman deserves a much better reception, and I recommend it to all those who are interested in finding out, in addition to what may be gleaned from our own American literature, the contentions, beliefs and offerings of Continental Europe as well.

We may as well be frank in dealing with the subject of vitamins at ths time: there has been such an offensive propaganda of general and radio advertising that the real accomplishments in the field of vitamins may pass with very inadequate review, and prejudices may keep us from sifting out the features that are extremely helpful and meritorious. Those who will take the time to read this book in Bauman's lucid reproduction will be greatly rewarded. The chapters are well chosen and there is no tendency to drift so far towards the chemical or biological research viewpoint that one is lost in a maze of technical debris. On the contrary, each chapter is very carefully drafted, with a desire to arrive at judicious clinical application, and the supporting bibliography attests the large amount of effort expended in the compilation.

Fortunately, extra attention is given to B and B Complex, and the material conforms very well with the conclusions that are being gradually drawn from our own American experience. Much less attention is given, for example, to Vitamin E, and the short chapter thereon attests its biological significance as far as man is concerned. Research in the department of vitamins is advancing so rapidly that it is not unexpected that there is little in reference to vitamin K and the bleeding of jaundice.

The appendix added by Dr. Bauman for the English addition comprises fifty pages, with a summary of the functions, possible results of deficiencies, and the results of a total lack of the various vitamins listed. There then follows the bibliography for each vitamin. The printing is exceptionally well done. I highly recommend the book.

E. L. Tuohy, M.D.

TREATMENT BY DIET. Third Edition. Clifford J. Barborka, M.D. 642 pp. Illus. Philadelphia: J. B. Lippincott Co., 1937. $5.00.

No change has been made in the general plan of this edition but the author has added a discussion of the present status of the vitamins and the use of protamine zinc insulin, and the subject of obesity is somewhat amplified.

The volume is divided into five main sections: Diet in Health, Application of Diet Therapy, Diet in Disease, Routine Hospital Diet, and Appendix.

Diets for diseases in which diet is of paramount importance and for conditions in which it is of varying importance are discussed and the objects of the diet in each case are given. Food tables specify the special kind of food which is lacking in a given case, calorie requirements and amounts in gram weight and household measure.

Various types of diets such as non-residue, liquid, soft, light or bland are given and also food which is appropriate for tube feeding.

The Appendix consists of a table of the average composition of the commonly used foods.

The author believes that lack of qualification or interest in the subject of obesity sends many of these individuals to quacks or leads to self-dieting. He also finds more interest in the medical profession in the use of foods as an adjunct to treatment.

The author has presented the subject clearly and concisely and his book deserves a place in the physician's library. Such a book is opportune. Malnutrition is prevalent. There has been voluntary dieting to procure a slender figure and during the depression involuntary dieting; and now there is danger of replacing supporting foods by vitamin (?) capsules.

Nellie N. Barsness, M.D.

ANUS, RECTUM, SIGMOID COLON: diagnosis and treatment. H. E. Bacon, M.D., Philadelphia: J. B. Lippincott Co., 1938.

This is undoubtedly the most complete book on this subject to date.

There are over 800 pages describing, in complete detail, all the diseases and deformities of the anus, rectum and sigmoid, as known today, with numerous illustrations and actual photographs.

Dr. Bacon is very liberal in discussing the opinions of other physicians and surgeons but he is not very generous in expressing his own beliefs and experiences. The bibliography and index have been most painstakingly prepared. References are made to practically all the literature, on this subject, written in this country and abroad. It is, therefore, extremely valuable as a reference book.

Dr. Bacon's book is so complete and detailed that it can be profitably read by either general practitioner, surgeon or proctologist.—H. W. Christianson, M.D.

OUTLINE OF ROENTGEN DIAGNOSIS. Leo G. Rigler, M.D., Minneapolis, Minnesota. 212 pages. 254 illus. Student's edition, $3.00. Complete edition (with charts), $6.50. Philadelphia: J. B. Lippincott Company, 1938.

Roentgenology covers such a wide field in diagnosis that it is difficult to enclose in one volume a textbook sufficiently detailed to be of great value. Dr. Rigler has met this problem by presenting his material in outline form. The result is so successful that this volume is not only a valuable text for medical students and physicians, but is also a ready reference book for radiologists.

The text is adequately illustrated by excellent reproductions of roentgenograms and by a new method of diagrammatic drawing of the findings observed in radiographs.

This book can be highly recommended.

Russell W. Morse, M.D.

MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

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ADVANCES IN THE PREVENTION AND TREATMENT OF CONTAGIOUS DISEASES OF CHILDHOOD*

ERLING S. PLATOU, M.D., and PAUL F. DWAN, M.D.

Minneapolis, Minnesota

CONTRIBUTIONS to the field of contagious disease prevention and treatment have become more numerous than ever during the past decade. Although a detailed knowledge of these is desirable, the scope of this article is limited to presenting a condensed survey of accumulated data focused on certain practical conclusions regarding a subject which is of such vital importance.

Statistical analysis of mortality rates in the State of Minnesota shows a general decline in the deaths from the more common diseases of childhood since 1915. A study in the allocation of mortality by age groups, however, reveals the fact that the deaths from diphtheria, scarlet fever, measles and pertussis in the pre-school age have remained practically unchanged during this period. A great deal of publicity has been given to immunization, hygiene, early diagnosis and treatment of contagious diseases in the schools of Minnesota, but apparently too little has been said relative to the need of instituting specific protection very early in life.

Diphtheria

As a result of immunization, Schick testing and detection of carriers by culture, the percentage of deaths in the school ages has declined materially since 1915 (Fig. 1). Little or no change in the mortality rate is evident for the infant and the pre-school child during this period of time, however. More attention must, therefore, be given to routine immunization against diphtheria during infancy and the optimum time for this procedure is at the age of six months. Toxoid is superior to toxin-antitoxin for this purpose and can be given in doses of 0.5 c.c. followed in three weeks by one c.c. About 90 per cent of cases so inoculated will show a negative Schick reaction after six months. Even better results (99 per cent negative) have been accomplished by giving a third dose (1 c.c.) one month later.[24]

Alum precipitate toxoid has been heralded[6, 7, 8, 22, 28] as being superior to all methods of diphtheria immunization since, due to its insolubility, it is more slowly absorbed and has a resultant prolonged antigenic action. It is prepared by complete precipitation with alum, which results in no loss of specific antigen, and simultaneously removes much of the undesirable protein. It is claimed that injection of five to ten units (0.5 c.c.) into children two to six years of age has resulted in 96 per cent negative Schick tests. The advantages of this preparation are stability, absence of sensitization to animal serum and the potency of the antigen. With improved methods of refining, the slight hazard of occasional abscess formation may be eliminated. Regardless of what antigen is used, however, it must be emphasized that multiple doses have been shown to produce a more sustained high level of immunity.

Schick tests should always be performed at intervals after immunization. Infection[15] and other factors may cause a diminution or even a loss of immunity.

Of greatest importance in diphtheria prevention is the early administration of toxoid. Godfrey[5] has demonstrated that immunization of 50 to 70 per cent of school children has reduced the diphtheria morbidity in a community very little while the addition of 30 per cent of pre-school children to the program has resulted in practically eliminating the disease.

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*Presented before refresher course in Pediatrics—Center for Continuation Study—University of Minnesota, October 1, 1938.

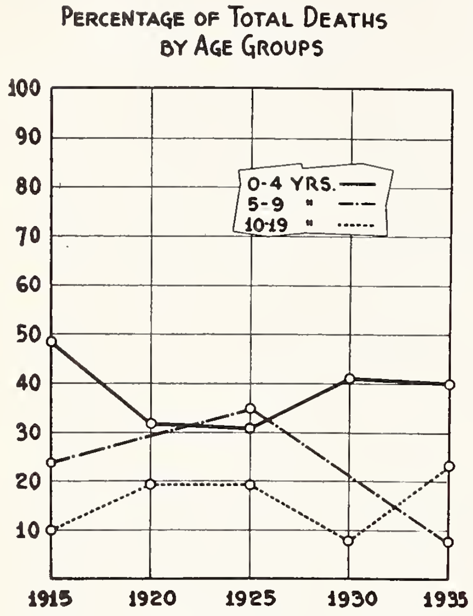

Fig. 1.

Park has said, "It is the infant who needs immunization most and is bothered by it least."

Scarlet Fever

Inspection of Figure 2 reveals the fact that one-third of the total deaths from scarlet fever in Minnesota occur in the pre-school age group and that there has been but little relative reduction in the mortality for this class during the past eighteen years. Furthermore, the deaths in the early school period (five to nine years) constitute an additional 30 per cent of the total mortality, so that about two-thirds of the total deaths are sill occurring previous to the tenth year of life.

Doubtless much of this early mortality could be avoided by the detection of early and mild stages of the disease, as well as of the transitory carrier state of immune contacts. More widespread utilization of the blood agar culture plate for hemolysis, the Dick test, the blanching test, careful isolation and serum should be emphasized.

Prevention by Immunization.—During recent years the concept of a causal relationship between a certain strain of hemolytic streptococcus and scarlet fever has been gaining favor. Although considerable unanimity of opinion exists today with respect to the specific etiology of this disease, nevertheless attempts to prevent it by inoculations with a toxin derived from the scarlet fever strain of streptococcus is not being practised widely. The failure to do this may be justified on the basis of the poor results obtained in the past following the administration of presumably inadequate doses of scarlet fever toxin. When the methods recommended by the Scarlet Fever Committee were used, the objections by patients to five inoculations and the occurrence of occasional reactions, together with doubt in the minds of many physicians, became factors which contributed to the reluctance of many to advocate immunization to their patients.

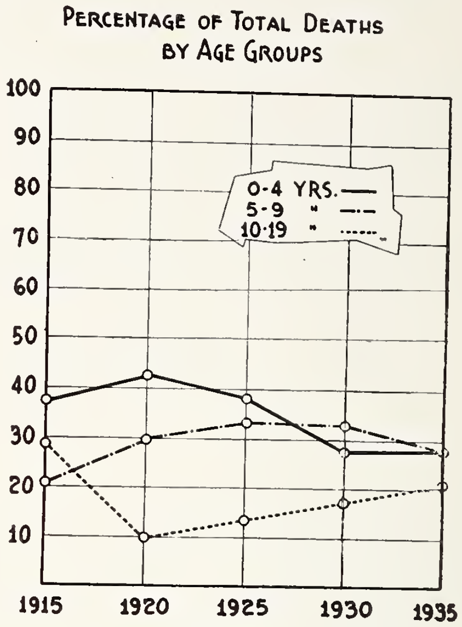

Fig. 2.

A question which may be properly raised and must be answered before specific prevention can be urged, is whether the method of immunization recommended by the Scarlet Fever Committee really has merit sufficient to justify its adoption.

The medical literature of the past ten years furnishes us with more or less data on over 50,000 inoculated individuals. Although a great many of the reported studies are lacking in detail and in proper controls, a sufficient number are suitable for analysis, so that we may arrive at fairly safe deductions relative to the protective value of inoculations with the Dick toxin.

In the present study, a change in reaction of the Dick test has been discarded in favor of subsequent case incidence as a criterion of immunity.

Table I presents a most exacting trial of the toxin's efficacy. Here are collected the reports on persons known to be susceptible by previous test. All of these persons had a relatively high degree of exposure to infection and were observed over considerable periods of time. A compilation of these data reveals the fact that among 20,000 susceptibles inoculated in accordance with the recommendations of the Scarlet Fever Committee, only one subsequent case was reported over a period of about three years. The annual incidence of the disease was 1.65 per 100,000.

TABLE I. SUSCEPTIBLE CASES REPORTED IN LITERATURE
Patients were immunized according to the recommendations of the Scarlet Fever Committee and annual incidence of scarlet fever per 100,000 among those immunized.

Author	Susceptibles (Dick positive)	Exposure	Time Observed	Subsequent cases
Dick	11,584	Internes & Nurses	5 years	0
Rhoads	298	Nurses	3½ years	0
Rhoads	492	Epidemic	10 months	0
Knights	26	Nurses	1 year	0
Kiefer		Institutions	3 years	1*
Dudley	17	Epidemic	2 months	0
Park & Schroeder	195	Institution	18 months	0
Hektoen	121	Nurses	4 years	0
Park	5,000	Institutions	5 years	0
Platou	149	Nurses and Children	3½ years	0
Peacock	35	Institution epidemic	2 months	0
Blatt	46	Institution epidemic	3 months	0
Broadbent	48	Nurses	4 years	0
Radoye	725	Institution	2 years	0*
Boynton	164	Nurses	3½ years	0
Veldee		Institution	2 years	0
Total	20,000			

Annual case incidence per 100,000........................1.65

*Preparation and dosage not entirely up to standard of Scarlet Fever Committee.

TABLE II. UNIMMUNIZED CONTROL CASES REPORTED
The annual case incidence of scarlet fever per 100,000 population among the unimmunized.

Author	Susceptibles and Immunes (No Dick test)	Exposure	Time Observed	Subsequent Cases	Cases per year
Dick		Internes and Nurses	5 years	(37)	(7.4)
Rhoads	182	Internes and Nurses	3½ years	15	4.3
Rhoads	206	Epidemic	10 months	15	13.5
Kiefer		Institution	3 years	(10)	(3.3)
Dudley	23	Institution Epidemic	2 months	2	12.0
Hektoen	516	Contagious disease nurses	10 years	40	4.0
Platou	861	Contagious disease attendants	6 years	55	9.2
Boynton	150	Nurses	4 years	8	2.0
Total	1,938				

Annual case incidence per 100,000......................2,317

Some of the studies included in the above table did not specifically state the number of controls. For this reason the uninoculated group reported in Table II is much smaller, although the cases included are comparable, since they are from the same institutions. It is noteworthy that these were not Dick tested and, therefore, represent a less susceptible group than the one in Table I. Over two hundred cases of scarlet fever occurred among these individuals during a period of several years observation. The annual incidence per 100,000 computed from 2,282 of these which can be utilized statistically is, therefore, 2,317.

The most convincing evidence regarding the merit of adequate immunization is found in a study of nurses from the Central School of Nursing at the University of Minnesota. During the past five years, two hundred and sixty-four susceptible nurses have been inoculated according to the recommendation of the Scarlet Fever Committee. Only one of these* has had scarlet fever during this period whereas twelve out of two hundred and fifty non-tested affiliate nurses have contracted the disease in the same period of time. Since both groups did similar work in their apprenticeship on the scarlet fever wards, they are particularly comparable.

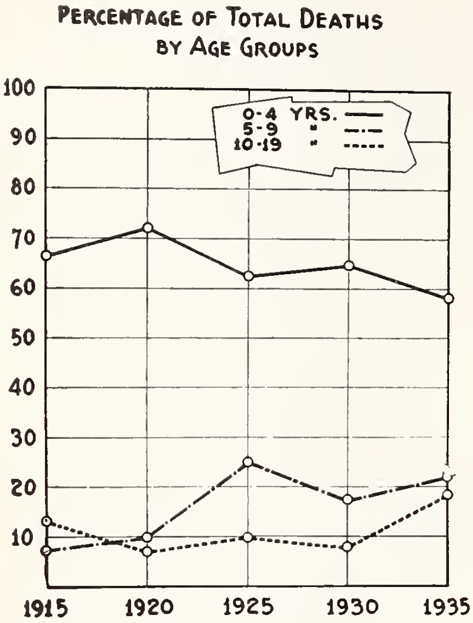

Fig. 3.

It would seem from the evidence available to date, that graduated doses of pure scarlet fever toxin administered to the point of a negative Dick test, has definite merit, and the procedure is warranted in spite of certain objections which operate to prevent its widespread use. The practice of immunization against scarlet fever for the prevention of institutional and community epidemics seems particularly desirable.[16]

Treatment.—Septic cases of scarlet fever with exudative manifestations in the nose and throat are most effectively treated by intravenous administration of large doses of convalescent human serum or by repeated immuno-transfusions. Toxic cases that can be treated early in their course are greatly benefited by large doses (12 to 18,000 units) of scarlet fever antitoxin. Sulfanilamide or neoprontosil in continued doses of .03 gm. per pound per twenty-four hours have recently been shown to effectively complement the specific serum and markedly reduce complications.[20] It is believed that this drug acts synergistically with the actively produced or passively conferred specific defenses of the body.

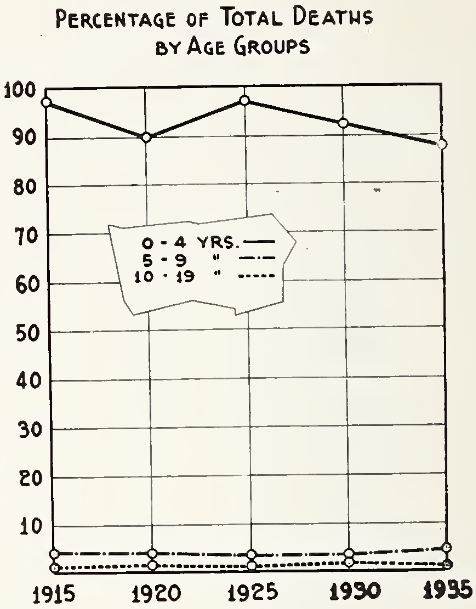

Fig. 4.

Measles

Attempts at active immunization against measles by Herman, Degkewitz and other workers have failed. Convalescent serum, first used by Weisbecker[27] in 1896, revived by Cenci,[2] Zingher[29] and many others, has probably been neglected too much. Elterich[4] pointed out that measles is a serious disease in the young, causing 8,000 to 10,000 deaths annually in the United States, most of which occur below the age of three years. Kaiser[9] contends that measles is responsible for 6 per cent of all child deaths, and states that the mortality is 55 per cent under two years of age. Lord[11] stresses the advantage of using whole citrated blood from adults in the family and believes in giving it after the appearance of the rash, to insure permanent immunity. Dulitskiy[3] and de Sousa[23] used adult blood and placental blood in doses of 20 c.c., and report attenuating the disease and reducing the mortality in similar groups of infants from 39.6 per cent to 4.6 per cent. They believe the serum loses its potency in thirty days. McKhann[12] prepared extracts of human placentas by precipitation with ammonium sulphate. Suspensions of this extract in saline, when injected into children exposed to measles, had a protective effect similar to that of convalescent serum.

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*The nurse who contracted scarlet fever was immunized to the point of a negative Dick test eighteen months prior to infection. A Dick test performed six months before her attack of mild scarlet fever was positive, but she was not reimmunized.

Immediate prophylaxis is best accomplished by giving 20 c.c. of convalescent human serum subcutaneously, combined with sulphanilamid by mouth.

In our experience,[18] convalescent serum, 6 to 10 c.c., or blood, 12 to 20 c.c., given intramuscularly between the fifth and ninth day of incubation have resulted in the greatest degree of attenuation and the least reaction. The production of prolonged immunity is not interfered with by this method.

Though most of us are prone to entertain the thought that measles is "just measles," inspection of mortality Figure 3 should convince us that such a concept is wrong; that not only should convalescent serum or blood be used as a preventive in debilitated children but as an attenuating agent in every small child exposed to measles. In pre-eruptive measles, large doses of convalescent serum (or immune blood) have recently been shown to modify the disease in a rather striking manner. The effects of sulfanilamide on streptococcal complications is now being studied.

Pertussis

Of the diseases under discussion, pertussis takes the highest toll in infancy and yet our methods for its control are the least effective (Fig. 4). Early diagnosis by means of blood studies (leukocytosis and relative lymphocytosis) the cough plate culture (with chocolate agar) and the isolation of the infected school child, may help to protect infants from exposure and defer the onset of the disease to a later period in life. However, in the average home, contacts are so intimate that these measures are inadequate. The eventual solution of the problem must be through immunization. Much progress has recently been reported in this field. Madsen[13] of Denmark probably revived the hope of an effective vaccine for prevention with his studies in Iceland. Sauer[21] reported a study of 396 children who were observed for five years following injection of 80 to 100 billion organisms in a vaccine prepared from fresh hemolytic strains of B. pertussis grown for forty-eight hours on Bordet-Gengou media to which human blood had been added. He contends that immunity results after a four-month period.

Kruger and Frawley[10] have reported studies with a vaccine prepared by destroying bacilli without resorting to heat and using very large dosage. Bailey[1] has produced a serum of high titre from birds which seem relatively immune to the B. pertussis. The studies of Rich[19] throwing some doubt on the Bordet-Gengou bacillus as the specific etiologic agent in pertussis may be somewhat disturbing to enthusiasts who favor vaccines made from this organism. From available data, however, it seems that freshly prepared Phase I type of vaccine offers some promise of sustained partial immunity especially if repeated (annual) antigenic stimuli are utilized.

A marked attenuating effect from large doses of convalescent serum given after exposure or early in the disease has been observed in a group of children studied by Bradford.

Erysipelas

Erysipelas is an extremely serious disease in infancy. The newer treatments are antitoxin, human convalescent serum, roentgen irradiation, ultraviolet irradiation and sulfanilamide.

Symmers and Lewis[25] have reported at length on the use of antitoxin. It is prepared by immunizing horses with eight strains of streptococcus, and is preferably given by intramuscular injection. They believe it helps to control the immediate attack and reduces mortality.

Concentrated roentgen ray therapy in erysipelas was first introduced in 1926.[17] The distance used was 10 inches, with 2 mm. aluminum filter, 111 kilovolts, 5 milliamperes, 5 minutes. It was found to be effective in limiting the spread of the disease and comparative studies indicate that it reduces mortality.

Although roentgen irradiation is effective, it has drawbacks such as inherent dangers, expense, lack of proper facilities, and that it must be given by a trained radiologist. Short wave ultraviolet therapy[26] causes a somewhat similar reaction in the skin. It is inexpensive, applicable, usually requires only one treatment although it may be repeated, and is without danger. It must be given at a distance of eight inches with an exposure of eight to fifteen minutes, one inch of the contiguous normal skin being included in the treatment area. The combined use of roentgen or ultraviolet irradiation convalescent serum and sulfanilamide definitely reduces the mortality of erysipelas. Transfusion is a helpful adjunct.

Epidemic Meningitis

When this disease is considered in the light of its pathogenesis, the rationale of certain therapeutic innovations may be more acceptable.

Meningococci invade the blood stream from minute foci in the upper respiratory tract. Subsequent loss of integrity to peripheral vessel walls occurs due to action of the toxin. This results in perivascular inflammation and hemorrhage, and organisms along with erythrocytes and leukocytes thus gain access to the skin or arachnoid or both. Meningitis per se is usually a late development.

Massive doses of highly antitoxic serum given intravenously to quickly neutralize the toxin have reduced the case fatality rate in the Chicago area from about 50 per cent to 15 per cent. Sulfanilamide alone has effected a high percentage of cures. The latter is now believed to be highly synergistic to serum (or other natural defenses in the body). Oral therapy with the drug is adequate due to its rapid absorption into all tissue fluids and the combined treatment is so satisfactory that intrathecal administration of either agent is now rarely resorted to. Fever therapy has proved effective in chronic meningitis.

Smallpox

In recent years, aside from the well-known glycerinated-vaccinia-vaccine, several newer antigens have been recommended: the chorio-allantoic chick embryo vaccine prepared according to the method of Goodpasture and the lyophile tissue vaccine of Rivers. The latter is administered intracutaneously and is particularly useful when children with skin diseases require vaccination, and when the vaccine has to be shipped under climatic conditions which may readily destroy the potency of the vaccine.

Rabies*

During the past fifty years, the original Pasteurian procedure has been modified primarily to increase the immunity and secondarily to reduce the complications in form of paralysis or even infection (Högye's method). The fixed virus is subjected either to heat or to the action of chemicals such as carbolic acid or ether. The so-called Semple or phenol treated vaccine is now quite generally used, and although the statistics regularly presented by McKendrick (Bull. Health Organization, 6:17, 1937) would indicate that the killed vaccines give rise to a substantial degree of immunity when given in adequate dosage, there is definite evidence that some preparations on the market are inactive and that, as a whole, they are inferior to vaccines in which the virus is alive but attenuated. On a comparative basis, the etherized vaccines prepared according to Alivisato's method are generally considered superior to the Semple vaccine.[29] Since the immunity mechanism in rabies is by no means understood, it is indeed difficult to evaluate the protection which may be conferred by certain preparations. It is not unlikely that the resistance of the ganglion cells to the virus is independent of the antibodies found in the circulation. For example, a veterinarian, who had been bitten on the thumb by a rabid dog, was thoroughly treated with Semple vaccine, developed neutralizing antibodies in his serum and yet succumbed to rabies.

While there are several objections to the use of live vaccines in the prophylaxis of most diseases, the fact that the case mortality rate in rabies is so high and the patient is already infected at the time of vaccination one seems warranted in taking greater risks when there is known infection. The so-called mixed treatment consisting of etherized vaccine followed by Högye's dilution method or vice versa seems to be justifiable in deep bites with localization on the head. Those who are frequently brought in contact with the problem of anti-rabic treatment may profitably consult a recent monograph by Mario J. Van Stockum (New Principles of Antirabic Treatment, Hague, 1935).

Tetanus*

Tetanus antitoxin acts not by interfering with the germination of the spores but by neutralizing the toxin as fast as it is formed. It should be used prophylactically in cases in which there is danger of contamination of a wound with manure, soil, stable dust, et cetera. The initial dose of 1,500 units (800 to 1,000 units) should be repeated on the fifth day after the initial dose. In fact, third and even fourth injections may be indicated when the wound is very bad. Since the protection wears off in the course of two or three weeks, sensitization with horse serum is undesirable and sometimes severe serum reactions accompany the treatment, there is a tendency to reinforce the passive immunity by means of active immunization. The latter procedure is equally advisable in children, who are constantly subject to injuries which may be followed by tetanus. The French Army has pioneered in this field of active immunization. Postinfectional preventive serum therapy is now enhanced by the injection of 1 c.c. of tetanus toxoid about fifteen minutes after the administration of the serum followed by two injections of 2 c.c. of toxoid at two weekly intervals. Such a treatment raises the antitoxin level of the patient's serum over one quarter unit per cubic centimeter, and although at least 1/200th unit may be demonstrable nine years after the injection of the toxoid, it is advisable to repeat the treatment every time a new injury is acquired. One injection of toxoid seems to push the titer over the minimal requirements. Ramon recommends highly the systematic active immunization of children against tetanus by using the combined diphtheria-tetanus toxoid mixture. Three injections at three week intervals in dosages of 2 c.c. are used in France. The usual contraindications, malnutrition and skin diseases equally apply to this procedure. As a rule, the local and general reactions are observed in about 20 per cent of the vaccinated regardless of the dose. Tetanus-toxoid alum precipitated has been used by McBryde and by Holdman in this country. Two injections of 1 c.c. each at an interval of two months followed by a third injection at the time of injury permit the practitioner to immunize the allergic child effectively and securely against tetanus.

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*Quoted verbatum from K. F. Meyer.

Whether or not antitoxin is of any value in man when given subsequent to the development of tetanus is a question that has received no definite answer. The evidence merely goes to show that in therapeutic treatment of tetanus, large and repeated doses of serum reduce the mortality. In practice, it seems advisable to administer the serum by the intravenous and intramuscular route. Patterson, who treated twenty-six consecutive children suffering from tetanus with only seven deaths (26 per cent mortality), used the intravenous and intramuscular route and enormous doses of serum (120,000 to 1,970,000 units). His critics claim that he could have reduced the mortality even further had he adopted the intrathecal administration of one dose of serum (20-30 c.c.) by the cisterna magna route as practiced by Yodh in India. The lumbar puncture route is quite generally considered less effective and even harmful.

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ESSENTIALS IN THE DIAGNOSIS OF CONGENITAL HEART DISEASE*

THOMAS J. DRY, M.B.

Rochester, Minnesota

AN UNDERSTANDING of the ontogenesis of the different congenital defects provides not only a list of the morphologic variations which congenital cardiac anomalies may assume, but also permits a clear understanding of the manner in which each anomaly modifies or burdens the physiologic mechanism of the cardiovascular apparatus. These constitute fundamental requisites for the clinical recognition of congenital heart disease in its various forms.

The Genesis of Cardiovascular Anomalies

If one begins with the premise that the cardiovascular system recapitulates its ancestral history during the course of its own development, it is reasonable to expect that, if arrest of development does occur, it will represent the adult form of one of the lower vertebrate series, dependent on the stage at which arrest takes place. The intermediate stages are, in fact, particularly well illustrated in the developing mammalian heart because it assumes functional activity at a very early stage of gestation. As in its phylogenetic history, it starts as a simple tube-like structure with the same subdivisions as the adult fish heart (Fig. 1*a*). Expressed in the simplest form its development from then on consists essentially in: (1) septal formations dividing the auricle, the ventricle, the bulbus cordis, and the common aorta or truncus arteriosus each into two sections (Fig. 1*b*); (2) torsion of the cardiac tube; (3) development of the bulbus cordis; (4) the incorporation of the sinus venosus into the right auricle (Fig. 1*b*); (5) the evolution of the aortic arches, some being obliterated, others becoming the permanent aortic arch, pulmonary artery and their branches; and (6) closure of fetal channels after birth.

Septal formations.—This process is the physiologic response on the part of the cardiac tube to the evolution of a lung-respiratory system so that the venous and arterial systems eventually become completely separated from one another. Any of these septal formations may be incomplete, resulting in any one of a variety of well-known defects (Table I). The cor biloculare in which no septa have developed is the replica of the fish heart. The amphibian form is represented by the cor triloculare biatriatum in which the interventricular septum is absent. Small interventricular septal defects, such as the maladie de Roger, resemble the adult form of the heart of some of the higher reptiles.

Now if it is realized that the different developmental processes which are being described are occurring more or less synchronously, it is apparent that multiple sites are liable to be involved, though isolated anomalies, of course, frequently occur. Normally, septal formations are complete after the seventh week of fetal life.

Torsion of the cardiac tube.—At an early stage the cardiac tube becomes kinked on itself by virtue of the fact that its extremities are relatively fixed as the primitive heart elongates (Fig. 1*b*). The torsion to which I refer, however, applies to a clockwise rotation of the bulboventricular end of the cardiac tube during which the aorta moves toward the left and partially behind the commencement of the pulmonary artery. If one will examine the anterior aspect of the adult normal heart this relationship will become clear. This torsion is necessary in order to bring the left ventricle into juxtaposition with that part of the truncus arteriosus which is destined to become the aorta, and the right ventricle into juxtaposition with the pulmonary artery. As in the adult heart of certain reptiles, there is a transitory stage in the human heart in which there are two aortæ connected with the left ventricle, each with two cusps. In the process of torsion, the right aorta is obliterated whereas the left remains open to become the outflow chamber of the left ventricle. If this process of torsion is arrested, the aorta is left in a dextroposed position, in which case the right aorta persists instead of the left, or the right and left aortæ may fuse to form a large aortic trunk. In either case this dextroposed aorta, instead of bearing the normal relationship to the left ventricle, overrides the interventricular septum (which is usually incomplete) and the right ventricle (Fig. 2). In other words the great vessels (the aorta and pulmonary artery) are transposed, and this transposition may be present in varying degrees depending on the degree of torsion that has occurred. Sometimes there is a small niche in the right ventricle which represents the obliterated right aorta. It is extremely likely that other developmental defects will accompany such a gross deviation from the normal, such as imperfect septal formations and incomplete evolution of the bulbous cordis.

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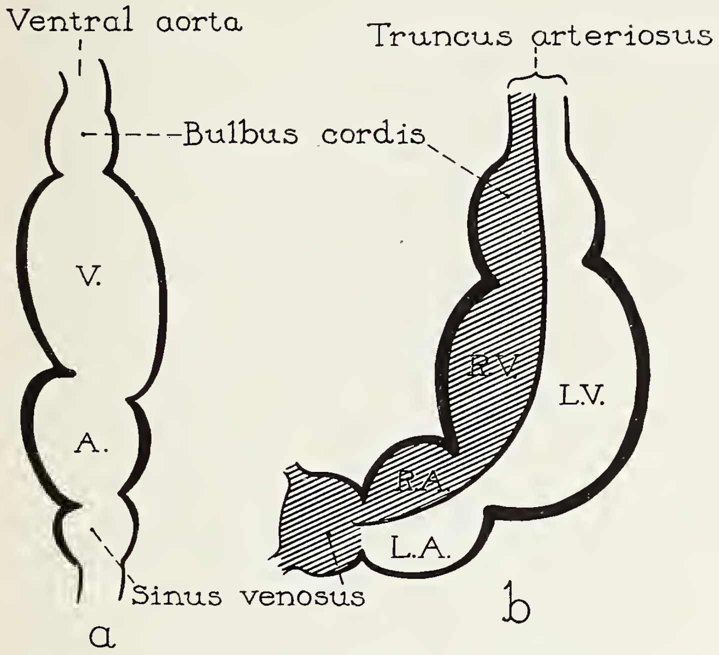


Fig. 1*a*. Fish type of heart, which is similar to the heart in the fourth-week human embryo; *b*, septal formation. The sinus venosus is incorporated in the right auricle, the bulbus cordis becomes part of the right ventricle (mainly) and of the left ventricle, and a clockwise rotation occurs in the bulboventricular part of the cardiac tube.

Here, then, one sees the genesis of one of the important and interesting anomalies representing arrest at the reptilian stage, namely, the tetralogy of Fallot. This consists of dextroposition of the aorta, with an interventricular septal defect, pulmonary stenosis and an hypertrophied right ventricle. Cusp anomalies are frequently associated with the tetralogy, especially in the form of bicuspid leaflets which are, interestingly enough, the normal for the reptilian species.

The development of the bulbus cordis.—Essentially this consists of the incorporation of the major portion of the bulbus into the right ventricle, to form the conus arteriosus, and a smaller portion into the left ventricle. If this process is incomplete, the corresponding ventricle will be constricted or stenosed in that region. Thus in the case of the left ventricle there will be a stenotic band below the aortic valve, that is, a subaortic stenosis. Its counterpart in the right ventricle consists of a subpulmonic or infundibular stenosis.

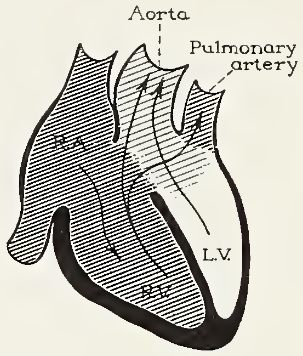


Fig. 2. The tetralogy of Fallot, showing a large aorta which is dextroposed and overrides the interventricular septum. The latter is incomplete. The pulmonary artery is stenosed and the right ventricle is hypertrophied. The left auricle is not indicated in this diagram.

In the genesis of some of the stenotic congenital lesions, fetal inflammatory processes probably play a part.

The incorporation of the sinus venosus into the right auricle.—In the adult heart the sinus venosus is represented by that part of the right auricle which receives the blood from the superior and inferior venæ cavæ anatomically known as the sinus venarum.

The development of the aortic arches.—Briefly stated, there are six pairs of aortic arches connecting the primitive ascending aorta to the primitive descending aorta. They are not all present at the same time. The left fourth arch becomes the aortic arch. The right fourth arch forms the innominate artery and the beginning of the right subclavian artery. The sixth arch gives origin to the pulmonary artery, and on the left side, to the ductus botalli.

The chief anomalous developments met are persistence of both fourth arches and persistence of the right arch in place of the left. The latter arrangement is closely related to coarctation of the aorta. The very plausible explanation has been given that if for any reason the left fourth arch becomes stenosed, then one of two terminations results, namely, coarctation, or the right fourth arch may remain patent, forming the aortic arch.[3] In the latter instance the patency of the right arch is salutary; it usually runs over the right bronchus and behind the trachea and esophagus to join the descending aorta. The left arch is here represented by the left subclavian artery, the stenosed fourth arch and a diverticulum which would have formed that part of the aortic arch between the point where the ductus botalli joins it and the descending aorta if the left arch had been normally patent (Fig. 3). Coarctation of the aorta is frequently associated with aneurysms of the circle of Willis.[4,15] Permanent patency of the ductus arteriosus (botalli) should be considered together with anomalies of the aortic arches, as the former is derived embryologically from the latter. The opening up of the pulmonary circulation after birth usually leads to gradual closure of the ductus. Should conditions remain such that pressure in the pulmonic circuit and the aortic arch remains the same as before birth, the duct will remain patent. Patency of the ductus is frequently associated with other anomalies of the aortic arches.

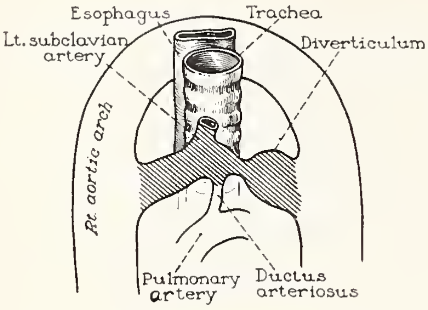


Fig. 3. Persistent right aortic arch, representing the right fourth aortic arch. Note its relation to the trachea and esophagus. The shaded part represents the left fourth arch which normally becomes the aortic arch.

Closure of fetal channels.—This refers to the closure of the ductus arteriosus and the foramen ovale.

Classification.—Associated with each of these processes, anomalous developments may occur and congenital cardiac lesions conveniently classify themselves under the corresponding subdivisions shown in Table I.

Such a classification is self explantory and easily remembered. Viewed in this light, the corresponding physiologic disturbance caused by each anomalous condition is readily understood and the symptoms and physical findings are more readily explained. By the same token it becomes apparent when cyanosis will supervene and when it will not. There is, therefore, no particular advantage in dividing them further into clinical groups.

TABLE I. CLASSIFICATION OF CONGENITAL HEART DISEASE

I. Anomalies associated with septal formation:
    1. Cor biloculare
    2. Cor triloculare biatriatum
    3. Cor triloculare biventriculare
    4. Auricular septal defects
    5. Ventricular septal defects
    6. Persistent truncus arteriosus
II. Anomalies associated with torsion of the cardiac tube and
III. Anomalies associated with development of the bulbus cordis:
    1. Subaortic stenosis
    2. Pulmonary stenosis
    3. Transposition of great vessels
    4. Tetralogy of Fallot
    5. Eisenmenger's complex
    6. Anomalies of the aortic and pulmonic valve cusps
IV. Anomalies associated with development of the aortic arches:
    1. Persistent right aortic arch with isthmus stenosis of the left arch
    2. Double aortic arches
    3. Coarctation of the aorta
    4. Anomalous origin of vessels arising from the aortic arch
    5. Patent ductus botalli
V. Dextrocardia
VI. Anomalies of the coronary vessels

Certain Facts and Findings Which Should Lead One to Suspect the Presence of a Congenital Cardiac Anomaly

Bruits not explainable on the basis of the conventional acquired valvular lesions.—Certain murmurs are described as being diagnostic of particular congenital anomalies. Thus, the so-called Roger murmur of a patent interventricular septal defect was originally described as a murmur which begins with systole and is prolonged to such an extent "that it entirely covers the natural tic-tac of the normal heart sounds"; the continuous or "machinery" murmur in the second left interspace is very characteristic of patency of the ductus arteriosus. What has not been sufficiently stressed is that the distribution of the murmur may be as important as the character of the murmur. Thus, in certain cases, a patent ductus botalli is associated with a soft systolic murmur heard to the left of the sternum, but one's suspicions should be aroused when such a murmur in this area is equally well heard near the left shoulder. No warning too strong can be voiced against making any diagnosis on the presence of systolic basal murmurs alone, since these murmurs occur in the absence of any organic cardiovascular disturbance, particularly under conditions, such as mere excitement or hyperthyroidism, which speed up the circulation. In many cases systolic basal bruits have been shown to be the result of minor degrees of calcareous aortic disease.[7] In any case of organic heart disease in which a systolic murmur is present the murmur will invariably be associated with other physiologic disturbances of the cardiac mechanism, which in themselves will supply the collateral evidence which must be present before a positive diagnosis is justifiable. This applies to any type of organic heart disease.

Thrills.—These are frequently present over the areas of maximal intensity of the bruits, and both thrills and bruits become more readily elicited clinically after exercise.

Evidence of venous-arterial shunt, with the usual manifestations: cyanosis, polycythemia, and clubbed fingers and toes.—In the group of cases in which the venous-arterial shunt is transitory, depending on temporarily induced increased pressure on the venous side, there frequently is a history of episodes of dyspnea or cyanosis. A rather unique feature relative to the cyanosis of congenital heart disease is the absence of edema when the cyanosis is quite pronounced.

Any unusual heart contour in the roentgenogram, such as a prominent pulmonary artery.—Points readily overlooked are: lack of prominence of the aortic knob; shadows to the right of the sternum running up toward the right sternoclavicular joint, as is seen in persistent right aortic arch, and erosion of ribs, which may in itself be diagnostic of coarctation of the aorta. These features are often better elicited by fluoroscopy.

Hypertension.—In a young individual hypertension should lead one to examine the strength of the pulsation in the abdominal aorta and femoral arteries and to look for other evidence to exclude or confirm the presence of coarctation of the aorta.

A cerebrovascular accident in a young person should raise the question of a ruptured aneurysm of the circle of Willis in association with coarctation of the aorta.

Congenital anomalies.—Congenital anomalies in any part of the body should lead one to examine carefully for cardiac anomalies. In Abbott's series,[1] 18.8 per cent of patients had anomalies elsewhere. Mongolian idiots, too, are prone to have congenital cardiac lesions.

Subacute bacterial endocarditis.—This frequently occurs as a complication of congenital heart disease.

Comment.—When the presence of a congenital cardiac anomaly is suspected, a search should be made for collateral evidence. The murmurs of congenital heart disease are frequently known to have been present since birth. A careful physical examination, a study of the contours of the heart, if necessary, by roentgenoscopy, and a study of the electrocardiographic pattern will contribute the necessary evidence for making a differential diagnosis. Once an anatomic diagnosis has been arrived at, the resultant physiologic mechanism should be reasoned out and checked against the physical findings. For instance, should a loud systolic murmur, best heard over the pulmonic area, lead to the conclusion that a patent ductus arteriosus is present, this opinion should most definitely be revised if the electrocardiogram shows left axis deviation, since this is exactly the opposite of what is consistent with such a diagnosis.

Finally, statistical evidence with reference to the frequency of different congenital lesions will serve to avoid diagnostic errors. Thus, a diagnosis of pulmonic stenosis is made far more frequently than its actual incidence, especially as an isolated lesion.

The Electrocardiogram in Congenital Heart Disease

If one can divorce from one's mind the idea that congenital heart disease is an entity separate from heart disease in general and adheres to the physical principles governing electrocardiography, the subject becomes much more clearly understood. With the single exception of dextrocardia with complete situs transversus, there are no diagnostic electrocardiographic patterns in congenital anomalies. The information so obtained serves merely as one link in the chain of evidence.

Again I must refer to the physiologic alterations concerned in any particular anomaly. If the condition is such as to throw added strain on the left ventricle, as in coarctation of the aorta or subaortic stenosis, a left axis deviation in the electrocardiogram will reflect such a condition as eloquently as it does in arterial hypertension or in acquired aortic disease. If myocardial changes result as a consequence, T-wave changes in leads I and II can be expected to follow.[5] It so happens that the majority of congenital defects are attended sooner or later by strain on the right side of the heart, either because of arteriovenous shunts or stenotic pulmonary effects. Corresponding roughly to the degree, there will be right axis deviation and perhaps T-wave alterations in leads II and III.[5] P waves may be exaggerated, as in acquired mitral stenosis, indicating greater auricular activity.

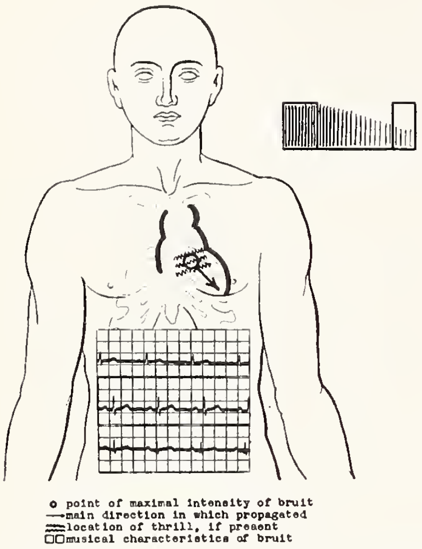

o point of maximal intensity of bruit
→ main direction in which propagated
≡ location of thrill, if present
☐☐ musical characteristics of bruit

Fig. 4. Interventricular septal defect. The heart contour is normal and the electrocardiogram is normal.

Conduction interferences are at times of considerable diagnostic help when caused by interventricular septal defects, while coronary types of T-wave changes have been noted when the coronary vessels originated from the pulmonary artery.[12]

Auricular fibrillation is very unusual except in a widely patent foramen ovale accompanied by distention of the right auricle.

Very meager information is forthcoming from the literature regarding the fourth lead in cases of congenital heart disease. Of the cases in which a diagnosis of congenital heart disease was made, a fourth lead (Wolferth) was recorded in seventeen. The frequency of abnormal changes is indicated in Table II. It is apparent again that such changes are not in any sense diagnostic but seem to be associated with a cardiac mechanism which throws an added strain on the right side of the heart, particularly if the strain is pronounced or of long standing.

A group of twenty-six cases reported by Edeiken, Wolferth and Wood,[8] in which the fourth lead showed the only electrocardiographic abnormality, included one congenital anomaly. The fourth lead was upright in this case and it was associated with right ventricular preponderance "to the extent of +128°."

The Diagnostic Features of Individual Congenital Anomalies

Interventricular septal defect (maladie de Roger).—Mechanism. There is an arteriovenous shunt because of the higher pressure in the left ventricle. With a failing left ventricle, or with increased pressure on the right side of the heart, the flow is reversed and under these conditions only does cyanosis occur.

The syndrome (Fig. 4). The bruit and the thrill are the important findings. Roger's original description[9] of the bruit has already been commented on. It is best heard in the third and fourth left interspaces and is conducted toward the apex. The second pulmonic sound is not accentuated. The heart's shape has been described as being globular but in the majority of cases it is normal, as is the electrocardiogram. Occasionally, however, there is evidence of interference with the conductive system. Symptoms are absent, but subacute bacterial endocarditis is a frequent complication.

Interauricular septal defect (widely patent foramen ovale).—Mechanism. The shunt again is arteriovenous until conditions arise which cause a reversal of pressures. Cyanosis is thus a frequent terminal event.

The syndrome. Until such events as just described occur, there are generally no signs or symptoms, no cardiac enlargement or abnormal contour features, and the condition may thus remain unsuspected and undiagnosed. A patent foramen ovale should be suspected when (1) there is a history of cyanotic spells or undue cyanosis during pulmonary infections, and (2) when systolic or presystolic bruits, with or without thrills, are audible over the upper portion of the sternum and are not otherwise explainable.

TABLE II. A RECORD OF FOURTH LEADS IN CASES OF CONGENITAL HEART DISEASE

Case	Age, years	Clinical diagnosis	Axis deviation	Fourth lead (Wolferth)	Cardiac symptoms	Comment
1	22?	Auricular septal defect and mitral stenosis	Marked R.V.P.*	Upright T wave Absent R wave	Early decompensation with cyanosis and clubbing	Exaggerated P_2 and P_3 waves
2	45	Patent ductus arteriosus and patent interventricular septum	R.V.P. (despite the presence of a superimposed hypertension)	Diphasic T wave Absent Q wave	Decompensation	Exaggerated P_2 and P_3; diphasic T_2 and T_3; delayed A-V conduction
3	22	Auricular septal defect and patent ductus arteriosus	Marked R.V.P.	Upright T wave	Early decompensation	Exaggerated P_2 and P_3
4	41	Patent ductus arteriosus with mitral and aortic endocarditis	R.V.P.	Upright T wave with elevated R-T segment	Early decompensation	Auricular fibrillation
5	27	Patent ductus arteriosus	R.V.P.	Diphasic T wave	Absent	
6	37	Patent ductus arteriosus	R.V.P.	Normal	Absent	
7	16	Ventricular septal defect	No preponderance	Normal	Absent	
8	61	Patent ductus arteriosus	R.V.P.	Normal	Absent	
9	45?	Ventricular septal defect	No preponderance	Normal	Absent	
10	23	Patent ductus arteriosus	No preponderance	Normal	Absent	
11	25	Ventricular septal defect	No preponderance	Normal	Absent	
12	52	Auricular septal defect with mitral stenosis	R.V.P.	Isoelectric T wave	Decompensation	Auricular fibrillation
13	24	Patent ductus arteriosus	R.V.P.	Normal	Absent	
14	20	Ventricular septal defect with patent ductus arteriosus	R.V.P.	Huge inverted T wave	Poor cardiac reserve	Inverted T_2 and T_3; incomplete bundle branch block; auricular fibrillation
15	19	Patent ductus arteriosus with ventricular septal defect	R.V.P.	Slight depression of R-T segment	Dyspnea on exertion	
16	27	Patent ductus arteriosus	No preponderance	Normal	Absent	
17	19	Ventricular septal defect	Marked R.V.P.	Deeply inverted T wave "M" notching of QRS with diminished Q and exaggerated S wave.	Dyspnea on exertion Cyanosis and clubbing present	Exaggerated P_2. Incomplete bundle branch block. Inverted T_2 and T_3.

*Right ventricular preponderance.

When symptoms do occur, there is usually evidence of right ventricular hypertrophy with enlargement of the pulmonary artery and also of the right auricle. The roentgenologic and electrocardiographic findings will then be in keeping with such events.

Comment.—Among congenital heart lesions, a widely patent foramen ovale is the only one which at times terminates in auricular fibrillation. Paradoxical embolism may occur, but subacute bacterial endocarditis is a rare complication.

Lutembacher's disease (mitral stenosis and interauricular septal defect).—Mechanism. Something of a vicious circle is created by the fact that an easier egress exists through the interauricular septal defect for the blood in the left auricle than through the stenosed mitral orifice (Fig. 5). This means that blood already aërated reaches the right side of the heart, to be sent to the lungs again. While this is no special disadvantage at first, the right ventricle soon hypertrophies, and when it fails, as it inevitably does, a reversal of blood eventually results from the right side of the heart to the left, and cyanosis develops. As decompensation is controlled the degree of cyanosis decreases.

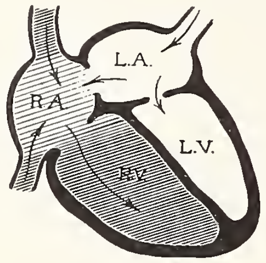


Fig. 5. Lutembacher's disease (patulous foramen ovale with mitral stenosis).

The syndrome. The syndrome consists of: (1) the auscultatory findings of mitral stenosis at the apex, (2) at times, a high pitched bruit audible over the upper portion of the sternum accompanied by a thrill (in a recent case the correct diagnosis was arrived at by this finding), (3) roentgenologic evidence of cardiac hypertrophy; especially affecting the right ventricle, a prominent pulmonary conus and an enlarged right auricle; the aortic knob is smaller than normal, and the pulmonary vessels may be so increased in prominence as to simulate pathologic mediastinal lymph nodes (Fig. 6) (in the case just referred to the preliminary diagnosis was mitral stenosis and Hodgkin's disease), and (4) marked right axis deviation in the electrocardiogram.

Comment.—Right heart failure eventually results.

Subaortic stenosis.—Mechanism. The mechanism is the same as in acquired aortic stenosis.

The syndrome. The syndrome consists of: (1) a harsh systolic bruit at the base transmitted to the vessels in the neck, (2) an accompanying thrill, (3) forceful action of the left ventricle in contrast to a weak radial pulse, (4) absence of symptoms, and (5) evidence of left ventricular strain roentgenologically as well as electrocardiographically (Fig. 7).

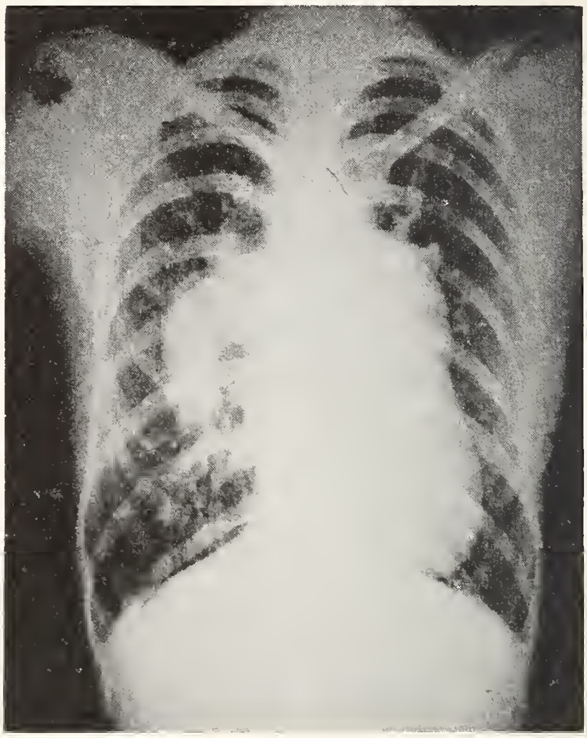


Fig. 6. Roentgenologic appearance of Lutembacher's disease, showing the enormous dilatation of the pulmonary vessels (simulating a mediastinal tumor) and the rounded apex, representing a much hypertrophied right ventricle.

Comment.—The prognosis is good.

Pulmonary stenosis.—Mechanism. (1) With a closed interventricular septum, the right ventricle naturally hypertrophies markedly. Depending on the degree of the defect, cyanosis almost inevitably supervenes, although the individual may reach adult life before it becomes noticeable. Once it begins, it is likely to be progressive, with increasing clubbing and polycythemia. (2) With an interventricular septal defect (which is far more common), the load is taken off the right ventricle to some extent, but cyanosis occurs earlier because of the venous-arterial shunt. In both instances the foramen ovale is likely to be patent, no doubt, because of increased pressure on the right side of the heart; this may add to the venous-arterial shunt.

The syndrome. The syndrome consists of: (1) A harsh systolic bruit in the second left interspace, which is transmitted toward the left shoulder and not to the vessels in the neck, (2) a well-marked thrill, (3) a prominent conus, and enlargement of the right auricle, (4) right ventricular strain electrocardiographically, and there may be T-wave changes in leads II and III significant of right heart strain, and (5) cyanosis, sooner or later, with the usual secondary manifestations (Fig. 8).

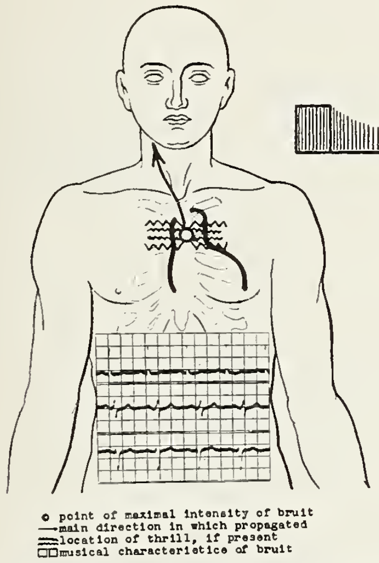
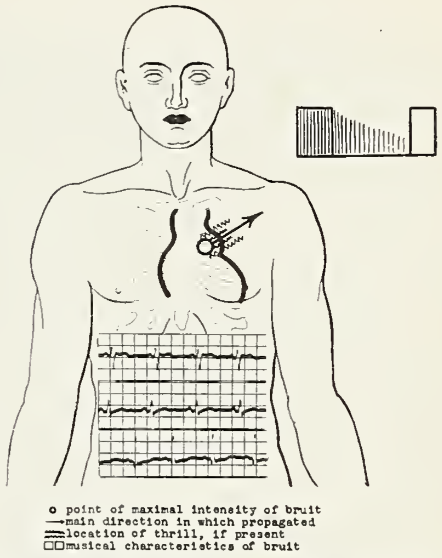

o point of maximal intensity of bruit
—main direction in which propagated
≡location of thrill, if present
□□musical characteristics of bruit

Fig. 7. Subaortic stenosis. The left ventricle is hypertrophied and the electrocardiogram shows left axis deviation.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≡location of thrill, if present
□□musical characteristics of bruit

Fig. 8. Pulmonary stenosis, showing the prominence of the conus shadow and the hypertrophied right ventricle. The electrocardiogram shows right axis deviation. The shading of the lips indicates cyanosis.

Comment.—Symptoms tend to develop early. Dyspnea on exertion heralds the manifestations associated with impaired oxygenation and myocardial damage. Not a few patients succumb to subacute bacterial endocarditis.

The tetralogy of Fallot.—Mechanism. As the right ventricle empties itself, the smaller portion of venous blood enters the much narrowed pulmonary artery, whereas the major portion enters the large aorta, which usually directly overrides the defect in the interventricular septum (Fig. 2). The venous blood which does get aërated returns to the left auricle and so to the left ventricle. With contraction of the latter, this aërated blood joins the stream of venous blood from the right ventricle in the aorta. It is apparent, then, that with the combined effects of the venous-arterial shunt and the much restricted pulmonary circulation, cyanosis will be prominent. The peribronchial vessels help, to a greater or lesser degree, to carry blood for aëration to the lungs, and the efficiency of this alternate route does a good deal toward establishing the prognosis in the individual case.

The syndrome. The syndrome is as follows: (1) Cyanosis tends to begin early in life and often becomes extreme, (2) bruits may be absent, but there is usually a systolic murmur at the base transmitted to the vessels in the neck, with or without an accompanying thrill, (3) the heart becomes sabot-shaped because of the prominent right ventricle without enlargement of the pulmonary artery, and because of the dextroposition of the aorta, the great vessels will be prominent on the right, and (4) there is electrocardiographic evidence of right ventricular strain (Fig. 9).

Patent ductus arteriosus.—Mechanism. Because of the higher aortic pressure, blood is shunted from the aorta into the pulmonary artery. While this is not particularly disadvantageous, it does increase the load on the right ventricle. When conditions arise which increase the pressure in the pulmonary circuit above that in the systemic circulation, a reversal of the shunt occurs, with cyanosis corresponding in degree and duration to the extent of the shunt.

The syndrome. The syndrome consists of: (1) A "machinery" or continuous murmur in the second left interspace which is transmitted toward the left shoulder, the second pulmonic sound usually being accentuated, (2) dulness in the region of the second and third left interspaces (Gerhardt's ribbon dulness), (3) a prominent conus shadow, and (4) right axis deviation in the electrocardiogram (Fig. 10).

Comment.—This is a typical example of a congenital lesion in which symptoms are absent in marked contrast to the prominent physical findings. The frequent development of subacute bacterial endocarditis renders the prognosis guarded, even though no serious mechanical difficulties are likely to develop.

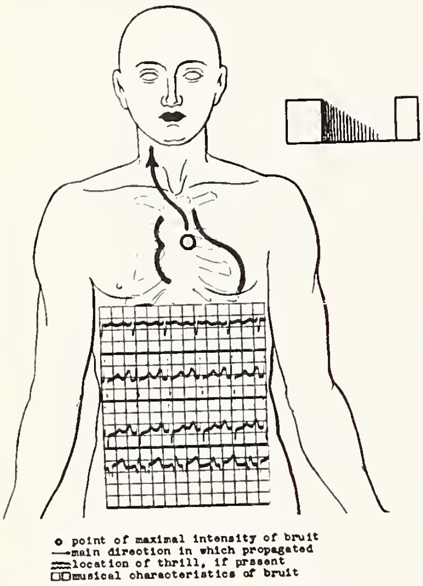
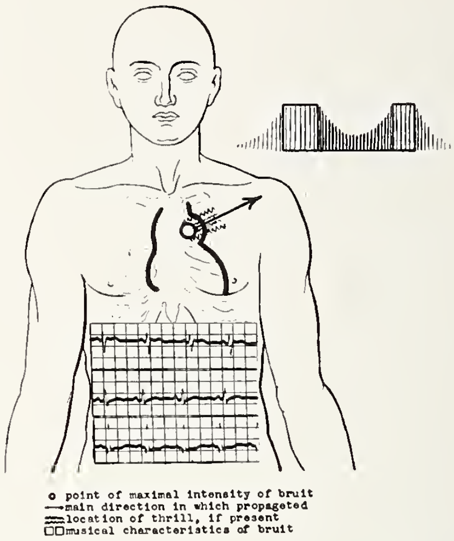

o point of maximal intensity of bruit
—main direction in which propagated
location of thrill, if present
musical characteristics of bruit

Fig. 9. The tetralogy of Fallot. Note the boot-shaped heart, the right axis deviation in the electrocardiogram, with a positive T wave in the fourth lead (Wolferth). The shading of the lips indicates cyanosis.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—main direction in which propagated
location of thrill, if present
musical characteristics of bruit

Fig. 10. Patent ductus arteriosus (Botalli). Note the prominence of the conus shadow. The electrocardiogram shows right axis deviation.

Coarctation of the aorta.—Mechanism. The obstruction to the aorta is usually just beyond the origin of the left subclavian artery, that is, at or near the junction of the ligamentum arteriosum and the aorta. The ligamentum arteriosum is the occluded ductus arteriosus, and it often remains patent when anomalies of the aortic arches are present. Interference with circulation beyond the point of obstruction depends (1) on the degree of coarctation, and (2) on the degree of collateral circulation which can be built up. The latter element, affecting mainly the intercostal arteries and the internal mammary artery and its branches, gives rise to characteristic clinical and roentgenologic findings in the form of pulsating vessels and erosion of the undersurface of some of the ribs (Fig. 11). The obstruction also results in increased pressure in the vessels arising proximal to the point of obstruction. In these cases pulsations in the abdominal aorta and femoral vessels are markedly diminished in contrast to hypertension in the upper extremities.

The syndrome. The syndrome is as follows: (1) a systolic bruit is often present over the base and is easily confused with acquired aortic stenosis, (2) a thrill may accompany the bruit, (3) there is evidence of left ventricular hypertrophy, (4) there is electrocardiographic evidence of left ventricular strain, and (5) there is evidence of the collateral circulation just described.

Comment.—Coarctation of the aorta may be latent for years, and congestive heart failure may first bring the patient to a physician. Very frequently, however, the condition terminates fatally as a result of the development of subacute bacterial endocarditis, and not a few patients die suddenly from a ruptured aneurysm of the circle of Willis, which is frequently an associated congenital anomaly. Many patients complain that their legs "go to sleep" very readily because of diminished circulation to the lower extremities. Others live to an advanced age and die from an unrelated cause.

Persistent right aortic arch.—Mechanism. Physiologically, the mechanism is perfectly normal and represents the avian arrangement. The abnormal anatomic situation, however, especially its relation to the trachea and esophagus, may cause symptoms of pressure referable to these structures.

The syndrome. The syndrome consists of (1) evidence that the ascending aorta is further to the right than normal, namely, dulness to the right of the sternum, pulsation in the second or third right interspaces, maximal intensity of the aortic heart sounds to the right and above the usual location, and strong pulsations in the right supraclavicular fossa; and (2) characteristic roentgenologic findings, which are (a) a shadow to the right of the sternum running upward toward the right sternoclavicular joint, (b) evidence of displacement of the esophagus and trachea toward the left (this is well brought out by fluoroscopy with a barium-filled esophagus, whereas a stomach tube may be delayed at the point of displacement and transmit the pulsation from the arch of the aorta), (c) absence of the normal aortic knob in the usual situation and the presence of a retro-esophageal aortic knob determined by fluoroscopy, and (d) corroborative evidence is supplied by eliciting, fluoroscopically, a diverticulum-like structure joining the descending aorta which represents the fourth left arch beyond the point of origin of the ductus arteriosus (Fig. 3).

Comment.—In most of the cases described, the heart is normal and symptoms may be entirely absent. So-called dysphagia lusoria resulting from esophageal displacement occurs but is frequently absent as in Arkin's[3] cases.

Congenital anomalies which are rare but in which the diagnosis may be suspected.—Anomalies of the coronary artery. McGinn and White[7] described the case of an infant who manifested attacks of distress on effort, such as when nursing, while the electrocardiogram showed T-wave changes of the coronary type. The heart was hypertrophied. At necropsy a single coronary artery was found arising from the pulmonary artery. The effects of anoxemia in this case were analogous to those in occlusive coronary disease.

Cor triloculare biatriatum. On the basis of another anomaly the same authors laid down the dictum that when in the roentgenogram a "water-bottle" shaped heart resembling a pericardial effusion is associated with intraventricular conductive disturbances in the electrocardiogram, a three chambered heart of the foregoing type should be kept in mind.

The Prognosis in Congenital Heart Disease

It is not always easy to prognosticate the future course of congenital heart disease. There is, however, with a few reservations, no reason to deviate from the usual criteria for judging cardiac efficiency. The heart is essentially a muscular pump and its main function is to maintain adequate circulation under the varying conditions incident to the daily life of the individual. With this as a premise, and it is common to all cardiac states, and with the general principle common to the wider fields of diagnostic medicine that an isolated sign rarely has much significance, the degree to which this, its main function, is interfered with in the main establishes the prognosis.

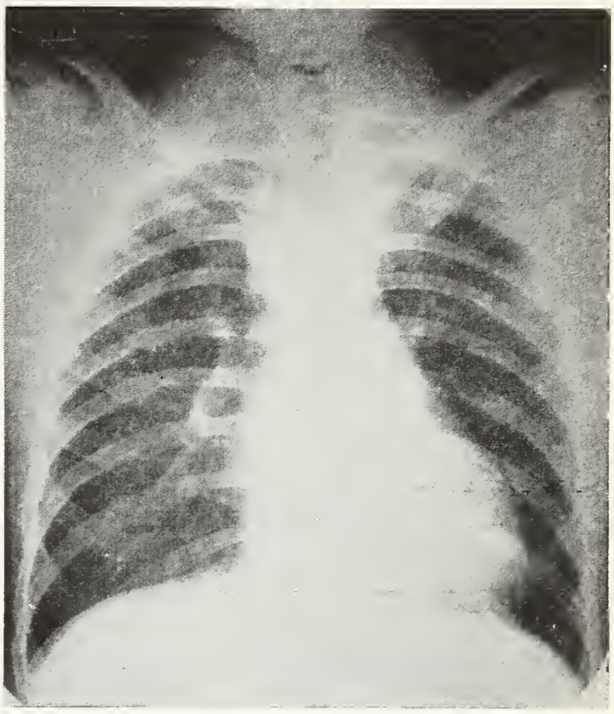

Fig. 11. Roentgenologic appearance of coarctation of the aorta: Note the absence of the aortic knob and the erosion of many of the ribs. The left ventricle is hypertrophied.

The nature and degree of the mechanical disadvantage are the first considerations; hence, again, the importance of establishing an anatomic diagnosis. In states such as patent foramen ovale, patent ductus arteriosus, maladie de Roger, and subaortic stenosis, it may be practically negligible and in spite of loud murmurs there may be little if any interference with the patient's activity. When, however, the degree of altered function is such as to place undue strain on one or more chambers of the heart, hypertrophy, dilatation, and later, loss of cardiac reserve, must inevitably follow. This undue strain is mainly brought about by abnormal shunts of blood through incomplete septa or through stenotic orifices, and finally, through extracardiac factors such as increased pressure within the pulmonary circuit. Evidence of hypertrophy or enlargement of individual chambers or of the heart as a whole then definitely influences the prognosis adversely, according to the degree of such enlargement.

The reservations previously referred to are occasioned by the vulnerability of the congenitally anomalous heart to rheumatic fever, by the frequency with which subacute bacterial endocarditis becomes engrafted upon it, and by the sudden death of an individual in apparently good health. Abbott's statistical studies supply enlightening information regarding the termination in various types of congenital heart disease.[2] Small interventricular septal defects with patent ductus arteriosus may interfere very little with activity, but in from 20 to 25 per cent of cases of both types subacute bacterial endocarditis develops. In contrast, a widely patent foramen ovale is hardly ever the basis for such a complication, but in about half the cases congestive failure eventually develops. For the group of cases in which lesions involve the pulmonary infundibulum, with or without associated ventricular septal defects and the different degrees of transposition of the great vessels, the prognosis is not good. Cyanosis is likely to develop early and to be progressive, and incapacitation is the rule. Subacute bacterial endocarditis terminates life in more than 20 per cent of this group.

The individual with coarctation of the aorta leads an existence beset with even more hazards. About a third of the patients die with congestive failure; subacute bacterial endocarditis claims about 10 per cent. An unexpected and dramatic termination is not infrequently the result of a subarachnoid hemorrhage due to rupture of an aneurysm of the circle of Willis, and rupture of the proximal part of the ascending aorta not infrequently occurs. Of Abbott's seventy patients with the adult type of coarctation, twenty-two died suddenly. Headaches, convulsions and other neurologic complications have been commented on.[15]

In spite of mechanical disadvantages and unpredictable hazards, however, remarkable instances of longevity have been recorded. Thus, Firket's patient,[10] a woman with combined mitral stenosis and an auricular septal defect, went through eleven pregnancies and three abortions and lived to the age of seventy-four. Lutembacher's patient,[11] also a woman and with the same type of lesion, lived to be sixty-one years old and went through seven pregnancies without heart failure, and two other patients with the same types of lesions lived to the age of seventy-four and sixty-two years, respectively.[6] White and Sprague's[14] case of the tetralogy of Fallot was even more remarkable. The patient, although cyanosed, lived a full life and died at the age of fifty-nine years and eight months. Erickson and Willius[9] reported a case of widely patent foramen ovale, so wide that a normal heart could be fitted snugly into the opening; yet the patient, a man, lived to be seventy-one years old.

Summary and Conclusions

A study of the embryology and comparative anatomy of the heart is essential in understanding the genesis and mechanism of human congenital cardiac anomalies. A number of these congenital lesions are recognizable clinically. The syndromes diagnostic or suggestive of interventricular and interauricular septal defects, including Lutembacher's disease, subaortic and pulmonary stenosis, the tetralogy of Fallot, patent ductus arteriosus, coarctation of the aorta, persistent right aortic arch, one type of coronary artery anomaly, and the cor biatriatum triloculare have been described.

While electrocardiographic evidence is important in the recognition of congenital heart disease, there is no diagnostic picture for any type except congenital dextrocardia with complete situs transversus.

The uncomplicated septal defects, patency of the ductus arteriosus, subaortic stenosis, and persistent right aortic arch may interfere with activity only to a limited extent, but the frequent occurrence of subacute bacterial endocarditis as a complication renders their prognosis guarded. Occasionally, an individual with a gross cardiac defect lives to an advanced age.

N. B.: All the illustrations used in this paper have been taken from a previous paper: An approach to the diagnosis of congenital heart disease. Am. Heart Jour., 14:135-154, (Aug.) 1937.

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POLYNEURITIS IN CHILDREN*

R. E. CUTTS, M.D.

Minneapolis, Minnesota

THE frequency of recent publications concerning Vitamin B, its components and related substances induced a request for a résumé of peripheral neuritis in children. When I agreed to prepare such a summary, it was my impression that patients suffering from polyneuritis were admitted to the University Hospital fairly frequently, and that a considerable group of case histories could be collected for analysis. This impression proved erroneous. Despite its apparently low incidence among the children of Minnesota, the prolonged and severe disability requiring nursing care, physiotherapy and, in some cases, orthopedic surgery make the condition an important one.

The gross pathology of polyneuritis is usually very minimal although some swelling and congestion of the peripheral nerves may be detected. Microscopic sections prepared with special stains will show disintegration of the medullary sheaths with lipoid deposits within the sheaths. There is usually some evidence of phagocytosis. Spindle shaped enlargements and granular degeneration of the axis cylinders may be seen.

The symptoms of polyneuritis are usually both sensory and motor. The motor symptoms begin with weakness which, in the more severe cases, progresses to flaccid paralysis with impairment or loss of deep reflexes. Sensory symptoms include pain, paresthesia, hypesthesia and less frequently anesthesia. Customarily the lower extremities are first involved with progression to the upper extremities and trunk. The distribution is roughly symmetrical.

General treatment during the active stage consists of supportive measures, elimination of foci and sources of toxin, improvement of nutrition, protection of the weakened muscles and the use of oxygen when the muscles of respiration are involved. As recovery progresses, physiotherapy and orthopedic appliances are usually indicated. Finally, surgery may be required to decrease disability where recovery has been incomplete. Specific measures are indicated where a specific etiology can be determined.

Many factors have been incriminated as etiologically important in the production of polyneuritis and the disease is roughly subdivided according to the supposed etiology.

Metallic poisoning, either accidental or as a result of therapy, accounts for a considerable proportion of these cases. Of the metals, the most frequent offender is lead. Lead may be ingested by children as a result of chewing paint from furniture and toys. Food and water may become contaminated from pipes or containers. Insecticides and sprays are other possible sources. Several children have acquired lead poisoning as a result of collecting foil or from molding toys with small casting sets. Children are infrequently exposed to lead directly from industrial sources but may be indirectly endangered as was the case when battery cases were used for fuel.

Four of the cases of polyneuritis in children admitted to the University Hospital in the past ten years proved to be cases of lead poison. Of these, two resulted from collecting foil. In one case foil was recovered from the feces. The other two were brothers who lived on a farm where a lead spray was used, but the exact mode of ingestion could not be determined. Confirmatory evidence by chemical analysis and by demonstration of a lead line in x-rays of the long bones was present in three of the four cases. In the fourth, positive x-rays were not obtained until approximately a year after the onset of the neuritis. Other findings which sometimes aid in confirming the diagnosis were absent in all four cases. These include anemia, stippling of the erythrocytes and a blue lead line at the gum margin. All four patients were markedly improved at the time they were last heard from.

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*Read at the annual meeting of the Minnesota State Medical Association, Duluth, Minnesota, July 1, 1938.

The prognosis for complete recovery after lead polyneuritis is not as good as after most types because there is apparently a more marked involvement of the spinal cord. In the cases presenting evidence of lead encephalitis the prognosis is considerably worse.

Special therapy during the active stage is aimed first at removal of the lead from the blood stream and later at removal of the lead from the body. The first is attempted by giving calcium, phosphorus, large doses of vitamin D and alkalies. Removal of the lead from the body is attempted by the use of the ketogenic diet, acids and parathyroid extract.

Arsenic is another metal which is capable of producing polyneuritis. In these cases the source is usually arsenic administered therapeutically either as an antiluetic or as a tonic. Accidental ingestion of rodent poison or insect spray is a less common source. Elimination of arsenic may be hastened by the use of sodium thiosulphate.[1]

Since the substitution of x-ray for thallium as a depilatory, especially in the treatment of ringworm of the scalp, children are infrequently exposed to this metal.

Recently bismuth has been used in place of mercury as an antiluetic and a few cases of polyneuritis from this source have been reported. They closely resemble the polyneuritis of lead and produce the same x-ray findings.

Cases of polyneuritis due to or associated with infections are less readily classified. That following diphtheria is considered the most common type in children. Diphtheritic polyneuritis is almost invariably preceded several days by local paralysis such as the paralysis of soft palate and pharynx associated with faucial diphtheria. Neuritis occurs almost exclusively in cases where antitoxin has been administered late or in inadequate dosage. The multiple neuritis usually appears from three to eight weeks after the onset of the disease. Weakness of the extremities with loss of tendon reflexes and tachycardia are the characteristic findings with sensory changes much less prominent. The extremities are most severely involved but neck, trunk and respiratory muscles may also be affected. No cases of diphtheritic polyneuritis have been admitted at the University Hospital in the past ten years. Only once was the diagnosis made at the Minneapolis General Hospital during that period.

A much smaller group of cases has been reported in which the neuritis developed several days after a brief febrile illness of undetermined origin.[9] The polyneuritis in these cases is roughly symmetrical, usually associated with bilateral facial paralysis, frequently affecting proximal muscle groups of the extremities more than the distal groups. The causative organism is unknown and more than one may be responsible. If the acute stage is survived, recovery is usually rapid and complete. One case at the University Hospital may represent this group. Ten days after the rapid development of weakness and paresthesia in arms and legs the patient was markedly improved and after two months his only complaint was that he tired more rapidly when running. Chemical, x-ray and blood tests were all normal at the time of his admission. Interpretation of his spinal fluid examination was obscured by a bloody tap previous to admission.

Periarteritis nodosum is said to be accompanied by polyneuritis in 20 per cent of the cases.[6] It occurs rarely and the neuritic symptoms are likely to be overshadowed by the other symptoms of the disease.

Polyneuritis occasionally complicates other diseases, notably tuberculosis, typhoid, paratyphoid, malaria, septicemia, pyogenic infections, scarlet fever and mumps. Diabetes in children is rarely complicated by polyneuritis. Two of the most frequent causes in adults, chronic alcoholism and pregnancy, are rarely encountered in children.

Some of the cases can only be classified as chronic polyneuritis of unknown origin. These usually develop progressively over a period of months or years until there is almost complete paralysis of the extremities and trunk. Even after this extensive involvement, slow but complete recovery is possible.[2] Two of the cases at the University apparently fall in this group. The history of one is particularly striking. An eight-year-old girl began to complain of pain in the legs and gradually developed a peculiar dermatitis. Weakness of the extremities began to develop after three or four months and progressed until the voluntary muscles below the mandible seemed almost completely paralyzed six months after the onset of the illness. For one week there was considerable difficulty with respiration. Approximately one year after the onset of the illness, while the child was at home, improvement began and continued until she was able to propel a wheel chair after another six months. When an orthopedist examined her six years after the onset of the illness he detected only a slight weakness of one foot for which exercise but no appliance was recommended.

Several drugs other than the metals previously mentioned have been cited as causes of polyneuritis. Among these are dinitrophenol, atabrine, sedatives of the chloral group, and, rarely, anesthetics including ether and novocaine. Occasional cases have been reported following the administration of foreign protein such as therapeutic sera.[12] Hematoporphyrinuria[5] and hematoporphyrin hydrochloride[10] used therapeutically may also cause polyneuritis.

Dietary deficiencies are known to be capable of causing neuritis. Classical beriberi as seen in the Far East and infrequently in the U. S. is the best example of polyneuritis definitely on a dietary basis. Much less frequently, neuritic symptoms may result from restricted therapeutic diets as used for gastro-intestinal disease and food allergy as well as the ketogenic diet, if no allowance is made for an adequate vitamin intake.

Wechsler[11] in 1932 expressed the opinion that vitamin deficiency is necessary for the production of toxic neuritis of obscure origin and is also partially responsible for some cases in which a specific poison is at fault. This may account for individual differences in susceptibility.

Strauss[8] gives one the impression that all types of peripheral neuritis, except those due to diphtheria, those associated with acute febrile disease and those due to exogenous toxins such as lead and arsenic are due to vitamin B deficiency. He believes that pregnancy, chronic infection, alcoholism, etc., provoke polyneuritis by decreasing the intake and absorption of vitamin and increasing the requirement. Spies,[7] Jolliffe,[3] Romano[4] and their co-workers agree that this is the case in polyneuritis of pregnancy and alcoholism.

Until recently, massive doses and parenteral administration of Vitamin B has not been practicable. Since B_1 is now available in pure concentrated form, information should soon be available concerning its use in the less common types of polyneuritis.

Nicotinic acid, which has proved quite effective in the treatment of canine black-tongue, a disease resembling pellagra, and of some of the symptoms of pellagra, seems to be quite ineffective in the treatment of the neuritic symptoms.[7] Whether the components of the B complex other than B_1 are likewise unimportant in the treatment of neuritis and whether large doses of B_1 orally or parenterally will have any beneficial effects in the treatment of polyneuritis following diphtheria, the metallic and drug intoxications remains to be determined.

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Discussion

Dr. J. C. McKinley, Minneapolis: Dr. Cutts has presented the important etiologic factors of peripheral neuritis and has assigned vitamin B_1 about the place that seems reasonable at the present stage of its investigation. Because of the variable severity and irregular duration of polyneuritis, it is difficult to assess the value of a single factor without painstaking clinical work under practically experimental conditions.

Most clinicians are unaware of an observation by neuropathologists which may partly explain the greater frequency of polyneuritis in adults as compared with children: namely, the fairly common occurrence with advancing years of arteriosclerosis of the vasa nervorum. Obviously a condition of decreased blood supply to the nerve would predispose to nerve injury on the superimposition of toxin, poison, vitamin deficiency or what not. This condition is being given detailed study at the present time in our Neuropathology Laboratory at the University of Minnesota.

WHAT IS NEW IN THE FIELD OF FOOD-SENSITIVENESS*

WALTER C. ALVAREZ, M.D.
Rochester, Minnesota

I HAVE been asked to tell you today of what's new in the field of food-sensitiveness. I use the word sensitiveness and not allergy because I feel so sure that food-sensitiveness is not always due to allergy; much of it is due to irritant or slightly emetic drug-like substances.

The first point I want to make is that in spite of doubt, amusement, and apathy in some quarters, the recognition of the importance of food-sensitiveness in the production of many puzzling syndromes is now spreading rapidly through the profession. In fact, interest has already reached that to-be-expected stage in which some men are so enthusiastic that they are seeing "food allergy" everywhere, and are beginning to starve their patients right and left.

Actually, the subject of food-sensitiveness must be of interest to everyone in medicine because one in every four dyspeptics is sensitive to at least one food, because specific reactions to food can upset the functions of so many of the organs of the body, and because every so often the physician can work a miracle by removing one or more articles from a patient's diet.

The physician is particularly likely to forget food-sensitiveness or to pooh-pooh the idea that this might be the cause of symptoms when he is dealing with a thin, frail, neurotic woman with a lot of curious aches and pains. It is so easy, and generally so sensible, to assume that all these symptoms are due to nervousness, fussiness, and constitutional inadequacy, but occasionally the physician will be wrong as I was awhile ago. For weeks I struggled in vain to help a thin, nervous woman who, in spite of everything I did, went on losing weight and having one migrainous headache after another. She had told me that she suspected that she was so sensitive to milk that she couldn't even touch butter, but since in years I had seen but two or three patients as sensitive as that, I had taken the statement with a large grain of salt, as we physicians so commonly do when a story does not hang together very well. Finally, in desperation, when my usual elimination diets did not help, I acted on her suggestion and removed every trace of milk and butter from her food, whereupon she lost her headache and misery and depression, and began to gain steadily in strength and comfort. Actually, it appears now that she can stand a fairly liberal diet so long as every trace of milk is kept out of the food. Even her bread has to be made without milk.

The Trouble Is Not in the Patient's Head

Now, a few years ago, I would have said, as some of you are thinking right now, that this sort of thing is in the patient's head, and that a physician who can believe such tales must also have something wrong with *his* head, but after the miracles of healing that I have seen in the last few years and after the remarkable improvement in my own bodily comfort that has come since I discovered the several decided sensitivenesses to food which, unrecognized, hounded me for most of my life, I am prepared for anything.

One must admit that the trouble is not in the patient's head when one learns that every so often, in spite of all his efforts to avoid his bête noir, he gets a bad upset due to eating the offending substance well concealed in other foods. For instance, a patient who knows of his great sensitiveness to chicken could not be hired to eat a piece of the meat, but for awhile after the discovery of the cause of his attacks of bloating, diarrhea, and mental depression he kept getting upset occasionally with the well-known syndrome, and each time a little detective work showed that the harmless-looking cream soup he had eaten for dinner had been made with chicken stock. He knows now that he must not even taste a soup of doubtful origin, because if it be made from chicken, two tablespoonfuls are enough to give him abdominal pain, a restless night and a headache next day.

Other patients who are highly sensitive, to, let us say, cottonseed oil, when away from home do not dare to touch anything fried, or any pastry made with shortening, or any salad with a dressing. They cannot recognize the nature of the fat used by its taste, and when a few hours later, the retching starts, it is too late to do anything about it. No, the trouble is not in their heads.

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*From the Division of Medicine, The Mayo Clinic, Rochester, Minnesota. Read before the annual meeting of the Minnesota State Medical Association, Duluth, June 30, 1938.

Two Problems Today

Curiously there are two big problems today in the field of food-sensitiveness: one is to get more physicians to wake up to the importance of the subject, and to keep on the watch for patients whose indigestion, headache, or mental hebetude is due to the eating of some food; and the other is to keep a few physicians from becoming so enthusiastic over the miracles that they have performed that they will starve patients unjustifiably, and for too long a time. Every so often now I see persons who have lost anywhere from *20* to *60* pounds in weight from having been left too long on either an elimination diet or a diet lacking a score of important foods. Usually the eating of these foods was forbidden simply because the skin happened to react to them; a little testing would have shown that these reactions had no significance and that the patient's symptoms were not due to the eating of any of the foods.

Skin Tests

Actually, no one should trust skin tests so implicitly. They are of considerable value in the search for the causes of hay fever, asthma and eczema, but commonly they are useless in the search for the causes of abdominal distress and headache. They are of so little value that we at The Mayo Clinic seldom use them for this purpose unless we are desperately in need of a hint, or we fear that if we do not use them a much-traveled and doctored patient will think we were negligent. Often the tests are nothing but a nuisance as when a fussy woman who has seen that her skin responded to certain foods, refuses ever to touch them again. Actually, no one should ever stop eating a food simply because the skin on one occasion reacted to it with a little wheal. One should reject a food only when it is found, on repeated trials, that every time it is eaten distress follows.

But if the skin tests are of little value, what is one to use? How about the leukopenic index: the test in which the leukocyte count goes down when the offending food is eaten? My impression is that this is too time-consuming and expensive for ordinary use. Furthermore, unless the counts are made most carefully with the patient under basal conditions, the conclusions drawn are likely to be erroneous. As Garrey has shown, the leukocyte count varies markedly from hour to hour during the day, and worse yet, there is no such thing as an errorless count. Even the most practiced girl cannot get five counts on the same blood to come out the same.

The Diary Method

I prefer to use two methods which are simple, practical and inexpensive, and likely to give conclusive results. When the indigestion or pain or headache comes in attacks at intervals of days or weeks or months, the best way of finding the offending food, granting that there is one, is to have the patient make each time a record of the unusual foods—not eaten every day—consumed in the twelve hours preceding the upset. Most suspicion should fall on food eaten at the preceding meal, because in most cases distress follows within a few hours after the eating of an injurious substance.

Most patients in trying to keep a diary make the mistake of putting down everything they eat, with the result that they pile up such a mass of data that they cannot learn anything from it. If, for example, a man gets his distress some day just before noon it will be silly to make note of orange juice, toast, and coffee if these are the foods eaten for breakfast day after day, when no symptoms follow. But, if on the particular morning the man broke his usual custom and drank chocolate instead of coffee, that is something to make note of.

After the patient has suffered three or four attacks the record should be examined to see if there was any one food eaten before each upset, and followed by distress every time it was eaten. If such a food is identified, it should then be left alone for awhile to see if the patient remains well. If relief is obtained, then the food should be eaten again and tested at least twice to see if its ingestion always brings an attack. If it does, this food should obviously be crossed off of the person's diet list. If it should be a food commonly used, like milk or egg, then the patient should make a study to see if he can take small amounts at intervals, or if he is so sensitive that he must not touch cake, puddings, and other foods containing milk and egg.

It is well that the patient in the diary make note, also, of any unusual fatiguing or upsetting incident that occurred before an attack, or of severe constipation, or the coming of a migrainous headache, menstruation, or a cold. Often such happenings are more productive of the symptoms than are changes in diet.

The Elimination Method

When the distress that the patient complains of is present every day, the problem of finding the offending food or foods must be simplified by reducing the number of possibilities. To do this I generally ask the patient to eat *nothing* for two days but lamb, rice, butter, sugar, and canned pears. I use these foods because I know from experience that they seldom cause trouble even in highly sensitive people. Occasionally, when the patient assures me that when he lives on nothing but buttermilk, or, let us say, beef, asparagus and string beans, he is well, I gladly start with those foods as an "elimination diet." The battle is all but won as soon as *any diet* is found on which the patient will lose his symptoms.

Every month I see highly allergic patients who searched for offending substances in the diet and failed to find them, usually because they were unwise in their choice of foods for the first elimination diet. Thus, I recently saw a woman who started off with milk and custards, which was about as bad a choice as could have been made because milk and eggs are among the commonest of offending substances. Worse yet, she kept on hopefully with this diet for a month in spite of the fact that none of the symptoms cleared up. Other patients fail in their search because their method is to give up first one food and then another. Since most food-sensitive persons have trouble with several articles of diet, it is obvious that this plan of eliminating one food at a time will seldom yield any information.

Usually, if the patient's troubles are due to food-sensitiveness, and the elimination diet used happens not to contain any of his particular offenders he returns *next day* to announce that the soreness and gas have gone out of his bowel, and his head feels clear again. Especially when the patient volunteers the statement that his head feels right again, I know that I have eliminated some injurious food, and I am almost certain that I am going to work a cure. All that remains then to be done is to add a food a day, testing one after another until all the offenders are found.

Usually I start testing foods that are not very common offenders because I don't want to begin by upsetting the patient and discouraging him, and especially if there has been great loss of weight, I want him to gain a little before I start "rocking the boat." Usually I begin by adding foods such as gelatin, carrots, asparagus, string beans, rye krisp, arrowroot cookies, turnips, potato, beef, apple sauce with tapioca or sago, and thin, well dextrinized toast. As soon as the patient has gained confidence and is satisfied that his trouble is due to food-sensitiveness he can begin to experiment with such common offenders as milk, chocolate, egg, and coffee.

If, however, the patient does not, in twenty-four or forty-eight hours, improve on the elimination diet of lamb, rice, butter, sugar and pears, the physician must *immediately* face two possibilities: either the patient's troubles are not due to food-sensitiveness, or else they are due to the eating of one or more of the five foods supplied. Oftentimes in the two days of observation a woman will show herself decidedly unreasonable and cantankerous; she will fuss and complain bitterly of her deprivations, or she will cheat or refuse to coöperate, or it will come out that the trouble with her is that she can't stand the appearance or the smell of the food, or that she becomes nauseated if it looks greasy, or that she becomes ill the minute she eats. The physician will then be almost certain that he is dealing primarily with either a nervous hypersensitive person, or a spoiled, undisciplined fuss-budget, or someone with but little gray matter between her ears. This, of course, is most helpful information because it will show the physician right off that he is never going to find any diet that will help, and he might as well stop wasting his time. The obtaining of such valuable information so quickly is one of the most useful features of the elimination type of diet, and one that, so far as I know, no one has as yet mentioned. This ability of the diet to unmask immediately overly nervous, psychopathic and uncoöperative patients should cause it to be used daily even by those men who do not believe in food-sensitiveness. In other cases the failure of an elimination diet to help a women with a sore, gassy abdomen will strengthen the physician's suspicion that the trouble is due to an inflammation of the gallbladder.

But to get back: if the patient appears to be sensible, and the symptoms and history strongly suggest an allergic disturbance, the physician will not give up but will try another simple elimination diet consisting, let us say, of beef, asparagus, string beans and gelatin. If this doesn't help in two days the chances are that the trouble is not due to any food. However, if the physician still thinks the symptoms should be allergic in origin and due to food, he can ask the patient to take nothing but water or only a little maple sugar for forty-eight hours. Then, if the discomfort persists, it is hardly likely that it is due to a food, and the patient might as well go back to a full diet.

The point that I would like now to hammer home is that an elimination diet is to be used for diagnosis and not for long-continued treatment. Occasionally a woman will be so delighted with the relief obtained on an elimination diet she will go back home, content to live indefinitely on her five foods, or if she does report back to her physician, it will be hard to get her to try any new ones. Usually, however, she is glad to have a wider choice, and always she must be helped to get back onto as full a diet as she can tolerate.

There is one group of persons who may have to be kept for several weeks on an elimination diet before one can be sure of the effect, and this is the group of patients with migrainous headaches who have only one or two a month. They should be given a little more liberal list so that they can maintain nutrition and not get too disgusted with the foods eaten day after day. In such cases Rowe's diets are helpful.

The Problem of Persons Highly Sensitive to Many Foods

Unfortunately, there are some persons who are so sensitive to so large a number of the common foods that the physician must make a big effort to supply substitutes and sufficient vitamins and calcium. Unfortunately, in our newly aroused enthusiasm for allergy, some of us physicians are doing today with foods what we for long have been doing with teeth: day after day we order teeth removed but we seldom bother to see to it that the patient puts back bridges or plates. Today foods are blithely being taken away from patients, without even a suggestion as to possible substitutions.

We physicians should be making a greater effort to help all highly food-sensitive persons, and especially those harrassed mothers who have to bring up asthmatic children that cannot touch many of the commonly used foods. A few allergists located in large cities are now inducing one or more bakers to prepare breadstuffs without wheat, milk or egg, and doubtless before long such foods will be prepared for shipment to patients everywhere.

There is need also for better labeling of foods. How, for instance, is a wheat-milk-sensitive person going to know whether or not he can eat an "arrowroot cookie"? Does it contain a little wheat and perhaps a little milk or does it not? Or how is the person tremendously sensitive to cottonseed oil going to know for certain that the "olive oil" he buys will not start him to retching when he puts a little on his salad?

The Need for Searching the Food Markets of the World

For those few persons who are highly sensitive to many foods we physicians must reach out into foreign countries to find substitutes: foods to which the man should theoretically not be sensitized because he never ate them before. Unfortunately highly sensitive persons will react badly to foods that they probably never ate before, but some harmless ones are likely to be found during the search. Particularly useful are some of the foods that constitute the "staff of life" for peoples in other countries. Probably the best is rice; it has no distinctive taste, and most persons can eat it daily without tiring too much of it. Other good starchy foods to try are barley, oats, rye, millet, lima beans, sago, and the several types of tapioca and arrowroot. Incidentally, I have solved the puzzle of how to give sago, tapioca and arrowroot without milk or eggs by having these starches cooked in apple sauce or mutton broth. Raw apples stand very high in the list of offending substances, but cooked apple seems seldom to give trouble. It is possible that a flour glutinous enough to serve as a binder in baking rice flour could be made from the banana, or from taro—that big starchy tuber which used to be the principal source of food in many parts of Polynesia. Taro flour, which makes a good tasty breakfast mush, is now being canned in Hawaii, and it should be a boon to many food-sensitive persons.

An excellent source of protein, carbohydrate, and fat is the tasty garbanzo or chick pea, which is a great favorite in Spain. The soy bean is good because it contains protein, carbohydrate and fat. Fortunately a way has now been found of removing its unpleasant taste. Dates supply much of the nourishment of the Arab. The avocado or alligator pear is now being raised cheaply in this country, and it can supply much needed fat to some patients. Persons highly sensitive to corn oil or cottonseed oil or to butter might try out a number of the oils that are derived from certain seeds such as sesame and rape.

A new science of world-wide dietetics remains to be opened up, and the day is coming when some grocery stores will carry a special line of unusual foods for the highly allergic person. Every minor constituent of these foods will be stated on the label, and the product will be guaranteed by the manufacturer to be exactly as stated. At present the food-sensitive person who lives in a large city can often enlarge his diet by going down into the foreign quarter and rummaging through the stores which supply immigrants with the foods eaten in their respective countries. In this way one of my badly starved, highly allergic patients obtained dried lichi nuts and chestnut flour from China, big fava beans and garbanzos from Spain, cassava flour from Africa or Brazil, and soy beans from Manchuria, all of which have been life-savers to her. When she came to me, she was living on only two foods and was down to skin and bones.

The Need for Taking Foods in Rotation

There is another helpful suggestion that I can make to the highly sensitive person, and that is to take in rotation the few foods that he can still eat. He must remember, first, that he is more easily sensitized to new substances than are most persons, and second, that whenever he finds some new food that works well, he is likely to eat it in such large quantities every day that he can hardly help becoming sensitized to it. As a result he soon is back where he was before, on starvation rations. Some time ago one such patient, who was nearly at the end of her rope and facing starvation, wrote me that she had solved her problem by taking in rotation a number of foods to which she was only slightly sensitive. By partaking of each food only once in ten days she didn't suffer much, and she did not increase her sensitiveness to the foods. I have since found this procedure very helpful. Fortunately, many persons so sensitive to, let us say, eggs, that they cannot take one every day without getting into serious trouble, can eat one occasionally with only slight discomfort.

Another new science awaits development and that is the science of so treating foods chemically that the harmful substances will be "denatured" and rendered innocuous to sensitive persons. Here is a chance for some young chemist who would like to be another Pasteur; the field awaits him.

Summary

Food-sensitiveness is common enough and important enough so that physicians practicing in many fields must be on the watch for it. It can be the cause of the symptoms even in neurotic and constitutionally inadequate persons. The trouble is certainly not in the patient's head. He has it before he even thinks it is due to food, and every so often he is poisoned by inadvertently eating his offending substance concealed in other foods.

Skin tests are seldom of much value in finding the offending foods. One must not trust them but must test each food by having the patient eat it.

When the upsets come at intervals the patient must keep a record of *unusual* foods eaten before the symptoms appear. If some one food is found to have been eaten before each attack it should be tested several times to see if it always causes the trouble. It should then be avoided to see if without it the patient can remain well.

If the distress is present every day a narrow elimination type of diet must be used. If on this the patient becomes comfortable, one food after another must be tried until the offenders are found and eliminated. If after a day or two on the elimination diet the patient does not get well, the physician must *immediately* face two possibilities: either the troubles are not due to food-sensitiveness or else they are due to the eating of one or more of the few foods supplied. Often during the two days of testing a patient will show herself so overly fussy or psychopathic or unreasonable or uncoöperative or stupid, that it is obvious that nothing can be gained from further dietary tests.

In other cases it may pay to shift to another simple elimination diet or to have the patient take only water for two days. If then the symptoms persist, it will be obvious they are not due to food.

A few persons are so sensitive that great search must be made through the markets of the world for new foods which they can eat. Some of these foods are described.

Patients who are highly sensitive to many foods should eat in rotation the few that they can still eat so as not to become sensitized to them.

Discussion

Dr. E. M. Rustan, Minneapolis.—I think that Dr. Alvarez has covered a very difficult subject in a most complimentary manner. His experience in these matters makes it possible for him to evaluate the efficacy of the various tests, and his warnings are most timely.

Hypersensitivity to food has received a great deal of attention during the past few years. The reason for this is that specialists, other than allergists, realize and recognize that food may cause symptoms previously inexplicable. Since this has occurred there is enthusiasm, as in any new phase of medicine, which in time disappears, and the true value of the subject remains. A few years ago most food sensitive patients were treated as neurotics by empirical methods of diet and change in environment. It is true that so called "neurotic complaints" are present in a high percentage of these patients, but it appears that as our diagnostic acumen increases the group of patients diagnosed as neurasthenics becomes smaller.

The greatest difficulty confronting the physician, in making a diagnosis of food hypersensitivity, is the interpretaion of the laboratory tests in common use. As the author has stated, skin tests are rarely of value in allergic gastro-intestinal disease or in allergic headaches. The tests are of most value in the atopic diseases, but their interpretation always depends upon the individual experience of the physician. Passive transfer tests, when positive, are of importance. However, in adults a strong reactor is oftentimes known to be the cause of symptoms. Leukopenic index tests may be used to a great advantage in some conditions. In many instances the combined results of all the laboratory tests give no specific information, and because of this the patient and the physician are oftentimes misled. Skin tests, leukopenic index tests, and passive transfer reactions do not determine the allergic status of the patient, and should be used only as aids in diagnosis.

After the food sensitivity has been proven, the management of these patients also presents difficulties. Dr. Alvarez has brought this out very graphically and he has emphasized the need for careful study, not only of the individual foods but also of the other foods that may be substituted. Avoidance of the causative agent or agents is the simplest manner of treatment in the majority of instances, as about 50 per cent of these patients may again take foods to which they were sensitive without producing symptoms, after a few weeks or months. Some foods such as wheat, eggs, and milk cannot be avoided because of age, geographical location, and finance. In these instances alteration of the foods by heating or oral hyposensitization is worthy of trial. If this is unsuccessful subcutaneous injection of a properly prepared extract should be tried.

In general the results of treatment depend, to a large extent, upon the physician's knowledge of allergy, and above all else the intelligent coöperation of the patient.

A TYPE OF CHRONIC NERVOUS DEPRESSION IN WOMEN RELIEVED BY THE ADMINISTRATION OF THYROID EXTRACT*

GORDON R. KAMMAN, M.D., F.A.C.P.

Instructor in Nervous and Mental Diseases, University of Minnesota
Saint Paul, Minnesota

THE clinical picture of myxedema with its objective findings of non-pitting edema, swollen face, supraclavicular pads of fat, coarse dry skin, sparse hair, stupid expression, slow movements, the patient's subjective feelings of lassitude, easy fatiguability, loss of initiative, poor memory, impaired concentration, and mental sluggishness is too well known to warrant description here. That an actual psychosis can form part of the clinical picture of myxedema is also well known. Wagner von Jauregg[5] said that 15 per cent of all patients with myxedema have psychoses. Karnosh and Williams[2] in a recent survey of a series of cases were able to corroborate this figure.

The reaction pattern of the psychosis of myxedema is a non-specific one. Ziegler[6] feels that the symptoms evoked by the general physical depression of myxedema are "individual expressions of latent hereditary disposition and constitutional tendency." The most frequent type of true psychosis seen in myxedema is what Adolph Meyer has called the dysergastic reaction. This is a delirious-hallucinatory episode characterized by clouding of consciousness which may extend to complete disorientation, unsystematized delusions of persecution, and excitability. When this reaction appears as one of the clinical manifestations of myxedema it is readily relieved by adequate doses of desiccated thyroid gland. In addition to the dysergastic reaction, other psychotic manifestations may exist as part of the clinical picture of myxedema. Moreover, the psychic manifestations may exhibit themselves before the classical physical appearance of myxedema is established.

During the past few years I have observed several patients who have exhibited a number of functional symptoms in common. It is my purpose in this brief paper to describe what I believe to be a clinical syndrome. No attempt will be made to expound the deeper philosophical minutiæ which the consideration of any psychopathological condition necessarily implies. The patients that I have in mind all were women, they all were in the 5th decade of life, they all were over weight, their basal metabolic rates were not reduced markedly if at all, the prevailing emotional tone was one of moderately severe depression without delusional formation, and the patients all were normalized by the administration of desiccated thyroid gland. Every patient had consulted numerous physicians, had received varying doses of bromide and other sedatives without relief, had listened to the usual "pep-talks" and other attempts at psychotherapy, all to no avail. Before receiving desiccated thyroid they had been suffering for from several months to several years in a state of chronic anxiety and moderately severe depression. They were given thyroid extract and, without sedation, without psychotherapy and without any supervision whatever of their life activities, they became physically and psychologically normal.

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*Read before the annual meeting of the Minnesota State Medical Association, Duluth, Minnesota, June 30, 1938.

Case Reports

Because of limitations of time and space, only three illustrative cases will be reported. Numerous other cases have been seen in private and dispensary practice. Only relevant psychiatric data will appear in the case reports.

Case 1.—Mrs. D. L. L., a divorced housewife, aged forty-two, was first seen by me in the Ancker Hospital Dispensary, Saint Paul, on June 18, 1935. Eight years previously she had had an hysterectomy and since that time there had been hot flashes and amenorrhea. In addition she was depressed and disinterested in her surroundings. Although there were no specific preoccupations, Mrs. L. had frequent crying spells, felt worse when she awakened in the morning, entertained thoughts of suicide, and felt extremely hopeless about the future. The physical and neurologic examinations were negative. The serologic tests on the blood and cerebrospinal fluid gave negative results; Hb. 91 per cent; R.B.C. 4,860,000; W.B.C. 8050 with a normal differential distribution; B.M.R. —13 per cent. Examination of the expressed gastric contents after a test meal gave normal values for HCl. The patient's weight was 210 pounds; pulse 76, temperature normal. Mrs. L. was placed on desiccated thyroid and almost at once began to feel better. I saw her at weekly intervals for the first two months, and the thyroid dosage was regulated to produce weight loss and to support the emotional tone without producing toxic symptoms. Mrs. L. now weighs 188 pounds (a loss of 22 pounds), her basal metabolic rate is +9 per cent, and she feels perfectly well. Her maintenance dose is 2 grains of dessicated thyroid daily.

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Case 2.—Mrs. A. J. E., a married housewife, aged forty-two, was first seen by me at Ancker Hospital Dispensary on June 4, 1937. At that time she was suffering from what appeared to me to be a typical involutional depression. She was depressed and disinterested, had daily crying spells, felt worse in the morning, and had a great variety of somatic preoccupations. She was afraid that she was going blind, afraid that she would lose her mind, afraid that she had abdominal cancer, and she tearfully resented any suggestion to the effect that she might be mistaken. From the very first interview she seemed to be on the defensive, and interrogation revealed the fact that she had consulted a number of physicians and had been told that there was nothing wrong with her, that it was "all imagination," and that she should "snap out of it." She had taken large amounts of sedative, all without relief. The physical and neurologic examinations resulted in negative findings throughout. Hb. 82 per cent; W.B.C. 8350 with a normal differential distribution; urinalysis normal; gastric expression not permitted, and the basal metabolic rate not determined because of a technical difficulty in the laboratory at the time. Serologic tests on the blood and cerebrospinal fluid were negative. The weight was 194 pounds, pulse 100, and temperature normal. Mrs. E. was placed on 2 grains of desiccated thyroid daily, and one week later reported that she was feeling better. Two weeks later the weight was 187 pounds, pulse 96, and she reported that she was feeling much better during the day but was unable to sleep at night. One month later her weight was 181 pounds, pulse 96, and the patient reported satisfactory progress. On August 26, 1937, she reported that she was very nervous. Her weight was 178 pounds, pulse 98, and the basal metabolic rate was +34 per cent. Thyroid medication was discontinued and within ten days there was a return of all the mental symptoms. Thyroid extract was again given in smaller doses and carefully supervised. By February 10, 1938, Mrs. E. was free from crying spells, she was doing all of her own housework, her weight was 155 pounds, pulse 88, and basal metabolic rate +15 per cent. I last saw the patient on April 12, 1938, at which time she reported that she thought that she was cured.

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Case 3.—Miss M. G., a clerk, aged forty-nine, consulted me in April, 1935, stating that she had been chronically depressed for six years. Her trouble began following a middle ear infection which she wrongly believed would result in mastoiditis, meningitis and death. At that time her preoccupation with the ear condition amounted almost to a somatic delusion. She was referred to an internist who gave her digitalis and placed her under supervision. A few months later the internist referred her to a neurologist who attempted a modified psychoanalysis. The patient was hospitalized for fourteen weeks and daily interviews were held with her in an effort to explain her fears and phobias on the basis of a sex repression. The woman being a frigid virgin and a very religious person besides, reacted to that form of psychiatric investigation in a very unsatisfactory manner. She became more and more depressed, developed ideas of self-accusation, and was convinced more than ever before that she was kind of a sexual pervert. When I saw her she was very much discouraged. She cried a great deal, had ideas of suicide, was unable to take any interest in her usual activities, slept very poorly at night, and her self depreciation was intense. Her ideas concerning fancied sexual perversion were very vague, poorly defined and unsystematized; but they formed a prominent part of the psychiatric picture. Although she weighed 210 pounds, and complained of easy fatiguability, I did not think of the possibility of hypothyroidism until the fall of 1936. At that time Miss G. began to complain that her hair was falling out, and she had missed two menstrual periods. Her psychiatric status was very much the same as it was at the time I first saw her. A basal metabolic rate determination was made and found to be —16 per cent. The gastric contents did not contain any free HCl; Hb. was 74 per cent; R.B.C. 3,940,000; and urinalysis negative. The patient was given dilute HCl and 2 grains of desiccated thyroid gland daily. She failed to lose weight or to notice improvement in her mental condition until she reached a maintenance dose of 5 grains daily. She is now taking this amount. Her weight is 185 pounds; Hb. 82 per cent; R.B.C. 4,500,000; urine, normal; menses, regular. Mentally she is very well. She occupies a responsible position, and in addition to that is meeting a very distressing home situation very adequately.

Comment

One must admit that in the cases reported above, hypothyroidism was not proven to be the cause of the psychiatric deviation. Ravin[4] states that when we speak of an individual as having myxedema we refer to the entire syndrome—slow mentality, dry skin, non-pitting edema, elevated blood cholesterol, etc., and not to the single feature of myxedematous infiltration of the tissues. He believes that since decrease or absence of thyroid secretion results in a state of myxedema in all of its features, we must consider myxedema as a manifestation of diminished thyroid secretion. Myxedema and hypothyroidism imply more than hypometabolism, and the terms should not be used in the absence of other evidences of diminished thyroid function, says Ravin. On the other hand, Hensel,[1] and Mason et al.[3] agree that it is possible to have true hypothyroidism without myxedema. In fact, Mason believes that the blood cholesterol is a more reliable indicator of hypo- or hyperthyroidism than the basal metabolic rate.

Whether or not the mental symptoms in the above cases were due to hypothyroidism or to hypometabolism from any other cause, increasing the metabolic rate by the feeding of desiccated thyroid did normalize the emotional reactions when other forms of treatment failed. It might be said that increasing the metabolic rate enabled the patients to establish compensation at the psychologic level and thus to meet their life situations in a more efficient manner. Bearing in mind the psychobiologic equation "Individual plus Situation equals Reaction" we might say that in some people the reaction of the individual without thyroid to a life "Situation" is one of mild melancholia. Just as in myxedamatous patients the electrocardiographic voltage is increased by the administration of thyroid gland, there evidently are other individuals whom increase in their "psychic voltage" helps to meet life situations. Without thyroid stimulation these people are inadequate, and they fail to compensate at the psychologic level. Stimulated by the administration of thyroid medication they find themselves able to react normally and adequately, and the resultant emotional tone is one that is not painful or distressing. It must be remembered that these people are not myxedematous and their basal metabolic rates are not reduced to any considerable degree. In this respect the clinical picture just described differs from that of the true myxedematous psychoses, and for this reason its cause is more liable to be overlooked.

Summary

Certain women in the 5th decade of life who are overweight and who have slightly reduced basal metabolic rates suffer from a form of chronic nervous depression which is relieved by the administration of desiccated thyroid.

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Discussion

Dr. L. R. Gowan, Duluth: I am sure we are all grateful to Dr. Kamman for presenting this series of cases, pointing out the psychic manifestations that one occasionally sees in a patient presenting glandular imbalance in which the thyroid may be the offending

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member. With our increasing insight into the importance of the consideration of each individual patient from a psychosomatic viewpoint, it becomes more and more apparent that psychiatric pictures are frequently due to physiological imbalance, as well as the fact that practically all somatic disease has a psychic component which plays a large part in determining its eventual outcome.

With particular reference to the cases cited, the question arises as to what result might have been obtained if these patients had been treated from the standpoint of pituitary dysfunction primarily, and thyroid secondarily. Dr. Kamman did not state whether any one of these patients had been treated from the standpoint of ovarian dysfunction, although they were all within menopausal age limits.

The average physician confronted by a woman in the forties presenting nervousness, characterized chiefly by depression, usually thinks of the possibilities of glandular imbalance, in which, of course, the thyroid is frequently involved. In the absence of objective signs of organic disease it is not enough to tell the patient that she is "just nervous and to go home and forget about it." Whether the reason is organic or emotional, there *is* a reason for every evidence of emotional disturbance which can be discovered in a very high percentage of cases, if sufficient time and painstaking search is made. When one realizes that at least 40 per cent of all patients have no physical disturbances, but have complaints based on emotional imbalance, it is apparent that the greatest deficiency in American medicine today is the neglect and misunderstanding on the part of the average physician of the importance of emotional balance, not only in preventing signs of nervousness, but also preventing the inception of organic disease and aiding its ultimate cure.

The lessons that we have learned from Dr. Kamman's presentation are so evident that they need no elaboration from me. However, I should feel that I were neglecting a wonderful opportunity if I did not stress to this group the importance of the mental hygiene approach to every patient in all branches of medicine. In doing this, allow me to refer to the work of Dunbar and her collaborators in New York which has been carried on over a period of eight years, under the title of "The Psychic Components of the Disease Process," the first report of which was presented at the annual meeting of the American Psychiatric Association in St. Louis in 1936 and the second report presented on June 7 of this year at the meeting of the American Psychiatric Association at San Francisco. These workers have studied the importance of the Psychic Component of the Disease Process in some 1,400 patients.

With your permission, let me read the conclusions of their first paper:

"1. Much of present-day medical treatment of somatic ailments is purely palliative and symptomatic in the sense that many somatic ailments (as well as many manifestations in the physical sphere which used to be considered organic disease entities) are merely symptoms of an underlying disease process developing in psychic and somatic aspects. This is borne out by our findings in the groups of patients reported.

"2. The psychic component may be determinative in illness, no matter how 'organic' this illness may appear to be, with the qualification that from the point of view of therapy as opposed to palliation, it is more significant in illnesses or phases of illnesses where the pathological changes are still reversible.

"3. From the point of view of the hastening of convalescence and the guarding against relapse, the rôle played by the psychic factor is determinative in a considerable proportion of patients (as reported here for patients with cardiovascular disease, diabetes, and fractures) although its exact nature and extent should be investigated further.

"4. It is probable that the psychic factor is specific, at least for certain disease processes or syndrome, such, for example, as "essential hypertension."

I realize that I have digressed considerably from the discussion of the paper just presented. However, I feel keenly about the need for the psychosomatic understanding of disease and I wished to grasp this opportunity to emphasize it.

Again I thank Dr. Kamman for his presentation.

FRACTURE OF THE ELBOW AND VOLKMANN'S ISCHEMIC CONTRACTURE*

HENRY W. MEYERDING, M.D.

Rochester, Minnesota

THE prevention of the disabling and disfiguring complication, which is seen most commonly among children, following fracture of the elbow, and which is known as "Volkmann-Lesser paralysis," "Volkmann's ischemic paralysis," "Volkmann's myositis" or "Volkmann's contracture," is of interest to every practicing physician. Although it may occur in cases in which the fracture has not been treated by a physician or by any form of fixation, there appears to be a belief that negligence and unskilled management on the part of those who are in charge of the treatment is the cause of this condition. This is the basis on which malpractice suits are founded. Since the time Volkmann first described the condition in 1869, various theories have been advanced as to its etiology and there have been different opinions as to the methods most efficacious in its treatment. I believe that the factors involved in its causation are now understood. The physician who carefully observes, and has the coöperation of his patient, who is cognizant of the early symptoms, and who carries out measures to prevent interference with the circulation of the forearm, may avoid the occurrence of this contracture. The general practitioner sees the majority of these patients first and it is his responsibility to see that the delicate soft tissues are not allowed to become irreparably injured as a result of intrinsic or extrinsic pressure. A record of the findings at the time of the first visit of the patient should be made. This record should include the interval between the injury and examination, as this has often an important bearing on the extent of swelling and cyanosis. The character of the pulse and presence of paralysis may determine the type of treatment. In those cases in which the physician finds serious impairment of circulation, he should request a consultation to protect himself and to give his patient the benefit of possible added skill in meeting the impending complication. The patient's family appreciates the gravity of the situation more than does the patient. The concern of the family, when consultation is obtained, results in a better understanding of the situation and lessens the likelihood of medico-legal entanglements should the result be unfortunate.

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*From the Section on Orthopedic Surgery, The Mayo Clinic, Rochester, Minnesota.

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Prompt and skillful treatment of fractures about the elbow in cases in which there has been no serious injury to blood vessels or nerves usually produces excellent results unless infection as a result of the primary injury or surgical treatment complicates the picture. What are the factors, then, which are present and which produce the ischemic contracture? The common fracture associated with this contracture is of the supracondylar type, in which the force that breaks off the lower fragment of the humerus carries the condyles backward and strips the periosteum away from the posterior surface of the humerus. The space thus formed promptly becomes filled with blood. The lower fragment is carried forward, pierces the periosteum, and may impinge on or cut blood vessels or nerves in its further downward course. The blood which forms about the site of the fracture infiltrates the antecubital spaces, compresses the soft tissues, and if there is a large amount of blood it may pass downward into the forearm. Should there be a ruptured artery, this intrinsic pressure alone may be sufficient to cause serious interference with circulation, which is of such magnitude as to produce an ischemic contracture. In cases in which improper transportation produces repeated movement of the fractured parts, further swelling and hemorrhage result and there is the possibility of laceration of previously impaired nerves, blood vessels and soft tissues. The thin walled veins are the first to become compressed and the return circulation is impaired or is completely cut off. The muscle spasm holds the bones in an overlapped position, which adds to the pressure, and the proximal fragment may impinge on the vessels and cause further injury. If no treatment is carried out, this fracture may result in malunion with, or without impairment of movement, or ischemic contracture. Should arterial hemorrhage continue, the subfascial hematoma produces distention, extreme pain, and tenderness at the antecubital space, and cyanosis, loss of pulse and numbness. The hemorrhage into the forearm is confined by the interosseus membrane, radius, ulna and the inelastic aponeurosis of the flexor muscles. The forearm, hand and fingers become cold, wet, pulseless and cyanotic and blebs appear. Pain is very severe, and unless intrinsic pressure is relieved, contracture occurs. It is a matter of hours, not days or weeks, before muscle tissue is injured, and the patient, as a result of unavoidable circumstances, may not have seen a physician or may not have had any form of treatment whatever. Should the patient arrive in such condition, expecting the fracture to be reduced and his arm put in a splint so that he may return home, an immediate consultation and hospitalization should be demanded, and a record should be made and witnessed for the protection of the physician.

Unfortunately, the general practitioner is forced to travel considerable distances daily and as a result is compelled to depend on others who often are unskilled to carry out his instructions. He may reduce a fractured elbow satisfactorily and leave his patient comfortable and free of pain, only to find on his return that swelling has occurred and serious injury has resulted. In some instances he will find that the fragments have slipped and unless he checks the reduction by roentgenographic examination he will be confronted with malunion. In 40 per cent of a series of cases of Volkmann's ischemic contracture, which was associated with supracondylar fractures, the fractures were malunited. Usually, the distal fragment was found malunited in a posterior position; occasionally, lateral displacement results in loss of carrying angle. The value of anteroposterior and lateral roentgenograms, which are made before and after reduction of the fracture, cannot be overemphasized. Under ideal hospitalization and nursing care, the physician has more protection against undue swelling and its disastrous results than he has otherwise.

Nurses and assistants should be instructed, however, to look for symptoms of impaired circulation.

In cases in which the swelling is sufficient to make reduction difficult and in cases in which immobilization in flexion with splints or casts results in pain, it is advisable to remove constricting dressings, place the patient in the recumbent position and elevate the arm. Should pain and swelling increase sufficiently to cause cyanosis or interference with the circulation, it is advisable to abandon the treatment of the fracture and care for the soft tissues. Of what use is treatment which results in good position of the bony parts at the expense of the function of the extremity? A properly reduced fracture that is held in position by retentive splints should not require opiates for relief of pain. Suspension of the arm above the recumbent body for a few days usually will permit reduction of the fracture after swelling subsides, without risk of incurring excessive pain or ischemic contracture.

When patients are ambulatory, the airplane splint is excellent and aids in the prevention of edema. Why so many patients are permitted to be up and about with arms swollen and cyanotic and hanging at their sides is difficult to understand.

A third group of patients are seen after the antecubital space is distended and tender and the pulse is faint; the skin has then assumed a bluish-red color and pain is unbearable, opiates having often been freely administered. If splints, bandages, adhesive tape, or casts have been applied, they should be removed and the arm should be elevated on pillows, with the elbow extended beyond a right angle. Warm, but not hot, moist dressings should then be applied. If within the next hour the swelling increases and the pulse is absent, the relatives must be warned as to the seriousness of the situation and preparations should be made to operate. Intrinsic pressure has in such cases become sufficient to block the venous flow, but the stronger-walled artery still permits a little blood to be forced into the arm. In the cases of older patients with impaired blood vessels and feeble hearts gangrene is possible, but in children the stage is set for ischemic contracture.

A fourth group of patients is encountered after several manipulations have been performed and considerable time has intervened since the fracture. The arm is then distended to such an extent as to demand immediate relief through surgical measures. There is no time to be lost, as degenerative changes may not be complete and viable tissue may yet be saved. It is at times impossible to judge accurately as to the amount of damage done to the nerves and blood vessels, for the circulation is no longer active and, with its loss, the nerve supply becomes numbed and the finer distinctions of sensation and motion are lost. Relatives should be advised and operation resorted to in the hope of preserving the function of the forearm, treatment of the fracture being of secondary importance. Skeletal traction, by means of a Kirschner wire through the olecranon, is an excellent method of correcting malposition of the fragments and should not in certain cases be overlooked as a useful aid, either as a preliminary to exploration of the hematoma or after careful operative inspection of the brachial artery and median nerve. Free incision over the hematoma and through the deep fascia liberates muscle tissue and blood which have been under tension. An incision mesial to the biceps permits the bicipital fascia to be divided close to the tendon, and the artery, vein, and nerve can readily be inspected. Complete rupture of the brachial artery has been observed as well as partial or complete severance of the nerve. The deep fascia over the forearm may require division, and this may be done subcutaneously by means of a special knife. The fracture may be reduced and internal fixation used by means of bone screws or Kirschner wire which may be passed up through the condyles into the proximal fragment. The entire arm is then enclosed in a large, moist alcohol and boric acid dressing and is suspended in abduction. The physician who has mastered the preventive measures described is in a position to meet the complications following supracondylar fractures in children and to prevent many of the disastrous complications of ischemic contracture.

Conservative Treatment of Volkmann's Ischemic Contracture

Volkmann's ischemic contracture may occur in a few hours, and the earlier treatment is begun the better the results will be. The consultant is often called after the contracture has been present for some time, and he finds the wrist flexed, the metacarpophalangeal joints extended, and the phalanges acutely flexed. Motion at the elbow is often restricted and the hand is held in pronation; supination may be impossible and numbness of the forearm exists. As the damage to the soft tissues may be benefited by release of intrinsic pressure, a consideration of the methods previously described should be given. No time should be lost in attempting gradual extension of the involved muscles, and the stretching method of the late Sir Robert Jones is generally recognized as excellent.

While the wrist is acutely flexed, it will be found that the fingers can be extended. Metallic splints are then fitted to each finger to maintain the corrected position. The patient now attempts systematically to extend the metacarpophalangeal joints, which are contracted. In a few days the joints stretch sufficiently to allow the application of longer splints, which extend to the wrist. After the wrist is exercised for a few days the splint is extended to the elbow, and among such splints can be used those which maintain extension of the hand. Thus the contracture is gradually and painlessly overcome.

I have found many splints in use, but prefer the simple and inexpensive wooden tongue-depressors found in every physician's office. With these padded and held by strips of adhesive tape, the principles of Jones may be carried out until stretching of the wrist requires longer splints, which are usually made of a thin piece of boxwood. The use of rubber bands to pull the extended hand toward the longer splint is useful in extending the wrist. The banjo-splint, used with rubber bands fastened to adhesive on the fingers permits the fingers to be exercised at all times and is most efficient; it is inexpensive, can be made in a few minutes, and permits the patient to be cared for at home.

Care must be taken to gain the confidence of these children, and after a short time they will become interested and will coöperate exceedingly well. Thus the first few treatments may consist of heat and whirlpool baths combined with light massage. The splints soon may be adjusted and worn during the intervals between treatments. Active motion is performed willingly, and as confidence is gained active motion may be supported by gentle passive motion and electrical stimulation. We at the clinic rely principally on heat and massage as aids to gradual stretching and do not believe that painful, passive motion or forceful manipulation under anesthesia is advisable.

The next stage in the treatment of Volkmann's ischemic contracture is that in which several months have elapsed since fracture, during which time treatment has been inadequate. The pain and swelling are gone and the hand is sensitive to cold and has the typical claw-like position; motion is limited. Usually the hand is held in pronation and there is limitation of motion in the elbow. Ulceration and scars from pressure of splints and bandages are not infrequent. Paralysis from primary injury, or secondary to scar formation, may involve one or more of the main nerve trunks. The radial pulse may be absent, and the arm and hand have lost the cyanotic appearance and are white. Attempts to straighten the fingers with the wrist extended brings out the tight flexor tendons and the hard atrophied flexor muscles; the finger nails cut into the hand of the examiner. The extensor group of muscles are, on the other hand, preserved or only slightly involved. There may be atrophy of bone, myositis ossificans, and roentgenograms may disclose malposition of the fracture, requiring correction. All forms of treatment now prove less satisfactory, and prolonged and adequate conservative treatment is best. First the Jones, or banjo-splint, method of extension, combined with physiotherapy, should be tried. When this has failed, the next stage is reached and surgery may now render the contracture more responsive to conservative treatment.

In the third stage a group of deformities of longer duration are encountered, years often having passed with the contracture persisting in spite of treatment. Marked contracture, atrophy of bone, scars, contracted capsules, nerve degeneration and impaired circulation, and a rope-like musculature challenge the most expert surgical care. The surgeon must now realize that no matter what type of operation is performed nor how skillfully it is done, he cannot bring about complete cure; when all other means have failed he is the only recourse, and he plans the operation in the hope of bringing about an improved cosmetic result and some return of function. If the flexor muscles are entirely fibrous the prognosis is poor. The surgeon should also remember that without careful postoperative care and prolonged and intelligent physiotherapy he can accomplish little.

Through lengthening of tendons the surgeon is able to obtain extension of the fingers and wrist, the extent and benefit of this procedure depending on the damage done. A longitudinal incision parallel to the palmaris longus muscle is made and the vagina fascia is divided, exposing the muscle and tendon. By retracting the fascia, the superficial group of muscles are exposed and the tendons lengthened by making two oblique sections, 2.5 cm. apart, three-fourths of the distance across the tendons and stretching them by means of a forceps passed underneath. The usual muscles lengthened are the palmaris longus, flexor carpi radialis, flexor pollicis longus, and flexor digitorum profundus. In some instances the surgeon will find the median nerve bound down in a fibrous scar and neurolysis will be advisable; also, the tendency to supination in the more resistant cases may be benefited by section of the pronator quadratus or the pronator teres.

I have observed a considerable difference in the amount of fibrous scar tissue and fixation of the structures about the wrist. In some cases it is possible to leave the tendons in their sheaths during operation, and a minimum of retraction, and scarring, and adhesions result. When lengthening of the flexor pollicis longus and flexor digitorum profundus is performed, considerable more trauma is likely to result, binding the entire mass in scar tissue. With care this operation may be carried out with distinct satisfaction to the patient; it allows correction of the deformity and improved function.

Neurolysis is beneficial, especially when pressure sores are obvious and scars cause contracture and fixation of the nerve. The findings at operation frequently lead the surgeon to conclude that the entire ischemic contracture is the result of injury to, and fixation and degeneration of, nerves. I feel that the changes in the nerves are usually secondary to the ischemia unless a primary injury or rupture occurs at the time of accident or manipulation. I have seen complete rupture of the median nerve following supracondylar fracture and ischemic contracture. In this series of cases the radial nerve was most commonly injured.

Resection of bone is resorted to in long-standing cases of contracture in which the tendons are extremely short and all attempts at conservative treatment have failed. A bone graft may be used to bridge and maintain the wrist in extension. The stretching of nerves and blood vessels after years of contracture, during which time the bone has grown and the tendons have remained as they were, is impractical. I cannot agree with some who condemn this operative procedure of removal of bone. There is a group of older patients with long-standing deformity in which resection of the carpal bones or radius and ulna gives excellent cosmetic results and a measure of functional benefit.

Lowering of the common origin of the flexors at the epicondyle is an operation which partially releases contracture and is used in combination with gradual stretching. It may be performed at the same time the median and ulnar nerves are examined.

When the proximal end of the humerus projects forward in malunion, preventing flexion of the elbow, or excessive callus formation or an ossifying hematoma exists, excision of the bony mass may be of benefit. Often there is contracture of the capsule of the elbow that will require capsulotomy. The biceps tendon may require lengthening as a result of involvement of the muscle from ischemia or long contracture. Even arthroplasty of the elbow would be preferable should the foregoing measures fail to permit movement and the function of the arm be not too seriously damaged. Sympathectomy has not as yet had a fair trial, but in one case it seemed to be of some aid.

Several patients have been encountered who had such extensive and long-standing deformity and disability as to warrant amputation, in order to rid them of a useless and unsightly deformity.

The prognosis depends on many factors: the age of the patient, the type of bandages, splints, and casts used and whether they have caused pressure sores and scars, the extent of hemorrhage, and whether good union or malunion was obtained, whether infection was present or there was damage to blood vessels or nerves, the presence of an ossifying hematoma, and degree of contracture and extent of fibrosis of muscle.

PRACTICAL POINTS IN ANESTHESIA*

RALPH T. KNIGHT, B.A., M.D., F.A.C.S.
Associate Professor of Surgery and Director of Division of Anesthesia
University of Minnesota, Minneapolis, Minnesota

THE subject for this paper was selected by the program committee and accepted by the writer. It does not attempt to present anything new or striking but rather to emphasize certain useful facts and procedures which are helpful in obtaining good sedation, pain relief, and operative facility with safety.

About twelve years ago a man came into my office, said he was a morphine addict and very much needed some morphine relief. I called the federal narcotic office, checked his identity, and obtained permission to administer some morphine. When I had prepared it the man said, "May I please give it myself?" He threw his handerchief around his arm, held it with his teeth, tightened his fist, adroitly inserted the needle into a vein in his forearm and sighed with relief as he pressed the piston home. When I told this to a doctor friend, he said he had had the same experience some time before and since then had always given morphine intravenously for relief of acute pain. I too have always done so since and so have many others. If the drug is dissolved in at least 2 c.c. and injected slowly, the pain will be relieved as soon as an adequate amount has been injected whether that amount is 1/12 grain or ½ grain. One is protected against giving an overdose or giving an inadequate dose and waiting fifteen to thirty minutes to know whether relief is to be obtained. The patient has the benefit of immediate relief. Morphine preparatory to a painful examination, manipulation or dressing, or before an emergency general anesthetic, may also often be best given intravenously. Sometimes when local anesthesia has been selected as the anesthesia of choice but the patient has had insufficient sedation, is afraid, excited, and unduly sensitive to the discomfort of the needle, this method of giving morphine is the best possible treatment. In all these latter circumstances, without the relief of pain to guide the dose, the injection must be made slowly and stopped as soon as any of the following symptoms appear: dizziness, weakness, sleepiness; or tingling, numbness, or aching in any part of the body. If the injection is made too rapidly, twitching or even convulsions may ensue. As soon as the proper dose has been given, the patient is at ease mentally and physically and unconcerned about the painful examination, dressing, manipulation, or injection of local anesthetic.

If real anesthesia is needed for some still more painful but presumably short procedure, one of the short acting barbiturates is available for intravenous use and represents one of the greatest advances in anesthesia. Evipal and pentothal sodium should be used in 5 per cent solution. About 1 c.c. should be injected each 10 seconds until the patient is unconscious and then 0.5 to 1 c.c. intermittently as required to maintain the desired level of anesthesia.

Support of the jaw and maintenance of an open airway is absolutely essential. Lundy's "butterfly," a wisp of cotton or slip of tissue attached by adhesive before the nostrils and lips, is a simple and helpful device and should always be used. The respiration tends to be so quiet and shallow that it is otherwise difficult to be sure that it is not being obstructed. Adequate relaxation for reduction of a fracture may be obtained immediately, but continuance of good relaxation, for any purpose, is unsafe because of the danger of respiratory-center paralysis. High concentration of the drug in all body tissues is produced, and recovery from a slight excess is no longer prompt.

One should never be tempted to use the intravenous barbiturates for procedures within the mouth and pharynx or even in the nose and antra. Muscles of the jaws and of the throat are not well relaxed by these agents without closely approaching paralysis of the respiratory center, and spasms of jaw, tongue, pharynx, and larynx are easily set up by any attempted manipulation, causing respiratory obstruction which is often well-nigh impossible to correct. A very difficult and dangerous situation develops in a high percentage of attempts to do such work under such anesthesia. If obstruction occurs, respiratory effort almost immediately ceases.

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*Read before the annual meeting of the Minnesota State Medical Association, Duluth, Minnesota, June 30, 1938.

Although the patient will awaken in a few minutes after the injection is discontinued at the end of a normal anesthesia, it must be remembered that coördination and judgment may not return to normal for perhaps an hour or sometimes two or three hours, especially if the anesthesia has been at all prolonged. If the patient must leave, he must leave as a patient, with a competent person to take care of him.

In the field of local anesthesia several special points are worth bringing up in such a discussion as this. One of the commonest uses of local anesthesia in office practice is for the removal of sebaceous cysts. The injection method of Dr. F. Z. Havens of Rochester is the simplest and most practical. The point of the fine small wheal needle is inserted into the skin over the center of the cyst. An intradermal wheal of 1 per cent procaine is started which is of course just outside of the sac of the cyst. Without changing the position of the needle at all the injection is continued until five, ten, or even fifteen c.c. have been injected. The wheal spreads out and the fluid spreads around the sac in all directions, dissecting it from the outer layers of the skin. The anesthetic solution follows the line of cleavage and tends to dissect out the entire sac, even though it may be a large one, so that when a shallow incision is made down to the surface of the sac, it delivers itself with almost no additional aid. If the cyst has been inflamed and has become adherent, it may be necessary to take out some surrounding fat in addition to the sac. It is then best to do a field block, surrounding the cyst with a linear subcutaneous injection introduced through two opposite skin wheals and then through one of these wheals a needle is inserted underneath the cyst and it is "teed up" by a deposit of 10 c.c. or more. The field is anesthetized in this same latter way for the removal of a lipoma. This method is much more satisfactory than injecting the line of incision and then indiscriminately infiltrating all tissues before entering them. The same is true of anesthetizing the abdominal wall. The lower intercostal nerves run diagonally forward and downward between the transversalis and internal oblique muscles to the rectus sheath, which they enter, and then divide to supply the peritoneum, the muscle, and the skin. If the incision is to be made through the mid-line, or one of the recti muscles, a row of wheals about 2.5 or 3 inches apart is placed from the xyphoid to the outer margin of the rectus, thence downward along the rectus margin. Through each wheal a needle is inserted into the rectus sheath and 10 c.c. of 0.5 per cent procaine is deposited in each place. All of these pools flow together, thus surrounding all the nerves as they enter the sheath. Skin, muscle, and peritoneum are anesthetized and the incision is made through normal, not edematous, tissues. When an anesthetic solution is injected, with the needle remaining in one postion, aspiration must be done frequently to make sure the solution is not being injected into a vessel.

A present day development is the production of anesthesia by the injection of the solution peridurally in the vertebral canal, between the ligamentum flavum and the dura, at any desired vertebral level. Twenty-five to 50 c.c. of 2 percent procaine are injected, which surrounds the nerve roots as they emerge from the dural sac, and a zone of anesthesia about eight vertebral segments wide is produced. Most of the hazards associated with spinal anesthesia are avoided and the duration is usually longer. It will behoove us to follow the development of this procedure.

Regarding spinal anesthesia, there are some points which can not be too often stressed. It has long been generally recognized that it is unwise to administer spinal anesthesia to a patient whose central nervous system has been subjected to injury or disease such as trauma, new growth, syphilis, poliomyelitis, pernicious anemia, etc. Subnormal neurons are more apt to be unduly or even permanently affected by the anesthetic, or, if they are not, the anesthetic may have to bear the onus of further development of the disease. It is unfortunately not so generally recognized that the nervous tissue is made more vulnerable by any state of depletion of the general health. Undernourishment, loss of weight, anemia, toxemia, and even lack of activity from confinement to the house or bed,—all of these increase the susceptibility to spinal anesthetics as well as general anesthetics. In the presence of these condtions one must decrease the dose and increase the dilution of the spinal anesthetic. Lundy has well demonstrated that 6 per cent, or 7 per cent at the very most, as the solution leaves the syringe, is the highest concentration which can safely be used, and often it is best to reduce the concentration to 2.5 or 3 per cent.

There is too general a feeling that spinal anesthesia has been a failure, and should not have been used, if it is necessary to supplement it with general anesthesia. I believe this is a wrong conception. Unless general anesthesia is absolutely contraindicated, the only disgrace connected with adding it to spinal anesthesia is in not adding it soon enough. It should be started at the very first indication that the spinal anesthesia is beginning to wane. Then it will be possible to do with a minimum of the general anesthetic. A delay of five minutes will probably double the amount of general anesthetic necessary. One should of course know how to produce as long a spinal anesthesia as may be safely obtained, but in many cases the patient will be best served by administering a very conservative dose of spinal anesthetic and then immediately superimposing unconsciousness by a minimum dose of general anesthetic. The relaxing effectiveness of the small spinal dose will be greatly increased and prolonged and the patient will not be harmed and will likely be the happier for the respite from consciousness.

General inhalation anesthesia in its present stage of development offers a fascinating field. There is available a variety of gases having various characteristics for varying needs. Fluidity of the gases may be increased by admixture of helium for cases of asthma or other partial obstruction of the tracheo-bronchial tree. Oxygen may be used in varying proportions. Carbon dioxide may be entirely or partially removed, allowed to accumulate or even added, as conditions indicate. Helpful airway devices of the nasal, oral, pharyngeal, intratracheal and even intrabronchial types are available and should be used whenever indicated. It seems to me that in connection with every hospital there might well be a physician who has prepared himself to offer as high a type of anesthesia service as possible. This would be a special boon to hospitals not requiring a sufficient number of anesthesias to warrant the employment of a full-time well-trained nurse anesthetist. If anesthesia is to be only a part-time activity, it certainly can be best done by a physician. I do not mean a physician who regards it as a makeshift, or as an undesired stepchild, or as a personal right, regardless of his lack of skill, simply because he has brought the patient in. I mean one of the community's physicians who is keen in other things, who sees in anesthesia an opportunity for expression of a high type of medical skill, and who will take as much interest and pride in bringing to the community's surgical patients the best obtainable in anesthesia as he does in the diagnosis and treatment of disease in general.

Discussion

Dr. Edward B. Tuohy, Rochester: Morphine given intravenously has a definite place in the field of anesthesia as an auxiliary drug to produce a sedative effect or relieve pain. Its intravenous use also permits the patient to retain full consciousness and thus to cooperate with the operator.

Recently I have acquired, from one of the commercial drug firms, a preparation of morphine sulfate (¼ grain, 0.016 gm.) in 1 c.c. ampules. To increase the ease with which morphine may be administered was the incentive for preparing morphine in ampules. It is my impression from a limited number of cases that the strength of the morphine sulfate prepared in ampules is definitely greater than that prepared by the usual method from tablets. I have found that, whereas $\frac{1}{12}$ grain (0.005 gm.) of morphine sulfate was the usual or average amount necessary to produce subjective effects when the solution was prepared from tablets of 1/6 grain (0.01 gm.), definite subjective symptoms, such as sense of warmth over the body, itching of the nose, and so forth, now are obtained from as little as 1/64 grain (0.001 gm.) when the ampule preparation is used. One can dilute the contents of a 1 c.c. ampule containing ¼ grain (0.016 gm.) of morphine sulfate with 2 to 3 c.c. of distilled water and thus administer a small dose with accuracy and safety.

The intravenous use of morphine for bronchoscopy has proved to be helpful and serves to reduce the nervous tension which many of the patients exhibit prior to bronchoscopic examination. The disadvantage of using the barbiturates for analgesia by the intravenous method for this procedure is that in some cases sufficient relaxation of the jaws is not obtained and the introduction of the bronchoscope is difficult. It is unwise to attempt to increase the depth of anesthesia by injecting intravenously more of a barbiturate, such as pentothal sodium, in such a case, because of the danger of depressing the respiratory center. In most instances, furthermore, the pharyngeal reflexes are somewhat exaggerated during intravenous anesthesia. In selected cases when intravenous anesthesia seems to be indicated for bronchoscopy, it is recommended that the throat be anesthetized by topical applications of 10 to 20 per cent solution of cocaine on cotton pledgets, and that sufficient depth of anesthesia be induced by intravenous injection of pentothal sodium so that the patient does not respond to definite sensory stimuli, such as pinching of the skin. At this depth of anesthesia the jaws should be relaxed reasonably and the bronchoscope can be introduced satisfactorily. The previous anesthetization of the throat by means of cocaine will serve to reduce the activity of the pharyngeal reflexes.

In this connection it may be of interest to mention the use of avertin fluid (tribromethanol and amylene hydrate) for bronchoscopy and for diagnostic ventriculography and encephalography of children. The basal metabolic rate of children usually is between

+20 and +40 per cent, and for the most part, children less than ten years of age tolerate well, larger doses of avertin fluid per kilogram of body weight than adults. The explanation of this phenomenon is that the increased metabolism of children serves to break down and destroy the avertin fluid faster than the lower basal metabolic rate of adults. Therefore, for bronchoscopy and encephalography in children, one can administer between 90 and 100 mg. of avertin fluid per kilogram of body weight. In the presence of pulmonary disease of children, such as pulmonary abscess or bronchiectasis, the use of avertin fluid as an anesthetic for bronchoscopic examination is fairly satisfactory. The relaxation afforded by avertin fluid is more than that produced by the intravenous administration of barbiturates and I believe that it is a safer anesthetic than pentothal sodium to administer to children. This barbiturate administered intravenously to children seems to depress the respiratory center too severely and for this reason it is not recommended except in unusual cases.

The production of adequate surgical relaxation of the upper part of the abdomen by means of spinal anesthesia is a problem which presents many angles. The fall in systolic blood pressure and the nausea attendant on high spinal anesthesia are the two annoying and disagreeable features of this procedure. In relatively tall patients satisfactory anesthesia of the upper part of the abdomen may be sustained by utilizing as sites of injection the upper lumbar interspaces and if necessary, the space between the twelfth dorsal and the first lumbar vertebræ. By using these higher interspaces in other cases one may obtain anesthesia of this region without materially increasing the dose of the anesthetic. When metycaine or procaine is employed for spinal anesthesia for operations on the upper part of the abdomen, the interspace between the first and second lumbar vertebræ usually is used. The dose of the anesthetic will depend on the weight, height, the concentration of hemoglobin, blood pressure and general physical status of the patient. Ordinarily, for upper abdominal operations at least 3.5 to 4 c.c. of cerebrospinal fluid should be aspirated into the syringe which contains the solution of the anesthetic before reinjecting the combined contents into the subarachnoid space. Frequently when satisfactory anesthesia has been obtained for opening the abdomen, the manual manipulation of the tissues about the stomach and gallbladder is disturbing to the patient and surgeon and not infrequently induces nausea and subsequently vomiting. In other cases nausea and vomiting ensue shortly after completion of the injection into the subarachnoid space and considerable muscular straining and motion of the abdominal wall are present.

Often the judicious administration of oxygen and carbon dioxide in cases of slight nausea will serve to control the symptoms, and those patients who are upset emotionally in addition to the nausea may be given a little nitrous oxide and oxygen or cyclopropane and oxygen in order to produce mild analgesia or very light general anesthesia. If spinal anesthesia does not seem to be satisfactory, it is unwise to force deep surgical inhalation anesthesia immediately, because within fiftten to twenty minutes after the anesthetic has been given, the most profound effect from the spinal anesthesia is usually obtained, and if deep inhalation anesthesia is superimposed on top of spinal anesthesia, it is a tremendous load for the patient's vasomotor and respiratory systems to withstand. It is infinitely safer to induce general anesthesia gradually in order to augment the spinal anesthesia and to bear in mind that approximately twenty minutes after the spinal anesthetic has been given the patient's blood pressure, pulse rate and character of respiration should be watched very carefully. In the majority of cases spinal anesthesia for operations in the middle portion of the abdomen, the pelvis and extremities is uncomplicated and ordinarily satisfactory. Because the quality of spinal anesthesia for operations in the upper part of the abdomen is not always consistently good, one may very well consider use of the intratracheal method of general anesthesia in certain cases, especially for patients who are not considered good candidates for local anesthesia. The merits of this method hardly need further amplifications at this time. The method is mentioned because it is such a useful procedure for different surgical operations in the upper part of the abdomen and on the colon.

Probably two of the biggest advances in anesthesia in the last fifteen years have been the introduction of the intratracheal tube as an adjunct to inhalation anesthesia, and the introduction of the short-acting barbiturates as a means of producing intravenous anesthesia. Pentothal sodium and evipal soluble are the two currently favorite agents for intravenous anesthesia and both are substituted derivatives of barbituric acid. The keynote in their use depends on the slow and intermittent or fractional administration. The degree of surgical relaxation is not the same as that afforded by other methods of anesthesia, but there are many indications for their use, especially for operative procedures which do not require more than thirty minutes. In the last year there have been reports by persons, experienced in the administration of pentothal sodium, on use of this type of anesthesia for various abdominal operations. For patients who are not robust or muscular, pentothal sodium may be used for abdominal operations, but its use should be specially indicated.

The indications and contra-indications have been mentioned previously but it is wise to emphasize the contra-indications again, namely, that children less than twelve years of age usually are not suitable candidates, and that dyspnea of cardiac or pulmonary origin in any case is a warning not to use pentothal sodium intravenously. Its use is contra-indicated also for persons who have taken food recently and have a full stomach.

HISTORY OF MEDICINE IN MINNESOTA

HISTORY OF MEDICINE IN RAMSEY COUNTY

BY J. M. ARMSTRONG, M.D.

(Continued from January issue)

In 1857, a census was taken in order to determine the Congressional districts preparatory to the admission of Minnesota as a state. The census was begun in September and finished about the end of the year. The list of those claiming to be physicians, dentists, and druggists, together with the age and place of birth of each, is given here. It differs somewhat from the list in the city directory of 1857-58.

Saint Paul

A. G. Brisbine	32	Ohio	Physician
J. B. Clemens	30	Va.	Physician
J. H. Stewart	29	N. Y.	Physician
L. H. Gabbard	28	France	Physician
J. M. Smith	30	Iowa	Physician
M. D. Patterson	28	N. Y.	Dentist
Thos. J. Vaiden	45	Va.	Physician
T. R. Potts	47	Penn.	Physician
C. Miller	34	Vermont	Physician
D. W. Hand	23	N. J.	Physician
J. W. Wharton	25	Penn.	Physician
Libby Dolbur	35	N. Y.	Physician
Samuel Willey	28	Mass.	Physician
T. D. Simonton	27	Pa.	Dentist
J. H. Studifred	25	N. Y.	Physician
D. C. Price	29	N. Y.	Dentist
A. Berthier	34	France	Physician
H. Welsted	37	Prussia	Physician
Geo. M. Kellogg	28	N. Y.	Physician
J. N. Schroeder	30	Prussia	Physician
S. Knapp	58	Maine	Physician
John Dewey	35	N. Y.	Physician
J. R. Jenks	29	Penn.	Druggist
J. T. Hayward	35	Delaware	Physician
George H. Sperry	50	N. Y.	Physician
L. C. Kinney	43	Ky.	Physician
Wm. H. Morton	28	N. Y.	Physician
John Steele	48	Pa.	Physician
W. H. Eldridge	40	Alabama	Physician
W. H. Wolff	26	Pa.	Druggist
Geo. Hadfield	43	England	Physician
Chas. P. Carver	53	N. Y.	Physician
F. R. Smith	47	Pa.	Physician
D. S. Hutchinson	30	Pa.	Physician
Francis Rieger	30	Prussia	Physician
Thomas E. Master	33	Md.	Physician
A. Berthier	31	France	Physician

County

R. Post	57	Connecticut	Physician
A. E. Boyd	40	Maine	Physician

There are names here that appear in no other place, and considering the circumstances of the census perhaps no opportunity was neglected to inscribe every possible name that might be included. It will be noted that A. Berthier is included twice, J. W. Wharton should be A. Wharton, J. H. Studifred should be J. H. Studdiford, Welstad should be Wedelstaedt, S. Knapp should be C. Knapp, C. Miller should be E. Miller, and Thomas E. Master should be Thomas E. Massey. Schroeder, though listed as a physician, was a druggist and opened a drug store in St. Paul in 1858. As to Clemens, Gabbard, Dolbur, Eldridge, and Carver, no other information is available. Perhaps they were drug clerks. Morton's birthplace was North Carolina, and Berthier probably was born in Berthier, Canada. The directory also lists one James Craig, student of medicine, resident at St. Joseph's Hospital.

Several physicians escaped the notice of the census enumerator, for David Day, J. V. Wren, J. A. Vervais, W. H. Miller, Sawyer, Rosenk, and others already mentioned were undoubetedly in St. Paul at that time. J. T. Hayward came from Wilmington, Delaware. He never practiced medicine in Minnesota, but was interested in real estate. He built a number of business blocks and died in St. Paul in 1859.

1858

No new physicians seem to have come to St. Paul during this year. The panic of the year before perhaps made St. Paul unattractive as a place to locate. Dr. J. H. Stewart, who had been county physician in 1857, sought the position a second time, but a vote by the Board of County Commissioners on January 6 resulted in the election of Dr. Vervais. The position carried a salary of $800 a year, paid quarterly.

1859

The medical happenings of 1859 are as meager as those of 1858. Two new physicians arrived: Wm. Caine, M.D., a homeopath, who inserted his card in the *Pioneer* on January 4, and Dr. Lloyd Dorsey, whose notice appeared on May 11. Nothing further seems to be known about the latter. A Lloyd Dorsey graduated from the University of Maryland in 1821, and a Lloyd Dorsey, Jr., in 1854. He may have been one of these two men. Caine remained here till his death, June 19, 1867.

At a meeting held in August, the trustees of St. Joseph's Hospital decided that "the interests of the hospital would be served by a temporary removal from the hospital buildings to those now occupied by the Academy of the Sisters of St. Joseph." The hospital was too large, for only three or four patients had been received since it opened. Furthermore, the city and county had made other arrangements for city patients. For these reasons the two log buildings on Bench Street, one of which had been the original Chapel of Saint Paul, were again used as a hospital. The arrangements that were made for city and county patients are not definitely known, but since the county commissioners had purchased in February, 1857, sixty acres of land at Pig's Eye (in Sec. 11, T. 28, R. 22, Washington) for a county farm, it may be presumed that the patients were cared for there.

Two physicians died in Saint Paul during the year, Dr. Hayward on May 14, and Dr. C. W. Borup on July 7. In July, Dr. Jno. C. Merrill associated with himself a Dr. W. M. Dunham. Dunham was a nephew of Doctor Boyd; both he and Merrill were homeopaths. Dr. W. E. Braun's name first appears as a resident of Saint Paul in 1859 when he was elected corresponding secretary of the French Canadian Benevolent and Library Association. He remained there several years, then removed to Little Falls. Dr. A. G. Brisbine was appointed a colonel in the State Citizens Soldiery. The exact nature of this office is not known; possibly, the doctor was a member of the Governor's staff.

It might be well, here, to pause in the narrative and review the years previous to 1860, as those years constitute the pioneer years of our history. Sixty physicians of all kinds are reported as having practiced in Saint Paul before the Civil War. Some drifted into other pursuits, but many left for other places as the country opened up and new towns came into being.

The medical problems these men had to face are described in several articles published in the medical periodicals of the day. Those of Wm. W. Finch, and Thomas S. Williamson have already been mentioned. Others include a short note by Dr. J. H. Murphy on Collodion in Mammary Inflammation and Smallpox" (*North Western Medical and Surgical Journal,* Chicago, March, 1851), and the report of Surgeon Geo. F. Turner, of Fort Snelling, in the *New York Journal of Medicine and the Collateral Sciences* for July, 1848 (Vol. 1, New Series, page 21), entitled "An Account of a Severe Form of an Epidemic Miliary Fever which Appeared at Fort Snelling, Upper Mississippi, in the Winter of 1847-48." The disease, no doubt, was scarlet fever. Two paragraphs may be quoted:

> ". . . of the forty-two cases which have come under my care, thirty-seven have been children under twelve years old (and this number embraces nearly all the children in this immediate vicinity), four were adult females and one male. Six deaths have occurred thus far. . . . It has prevailed epidemically among the Sioux Indians of this vicinity while on their winter hunt, attacking indiscriminately all ages and sexes; but with them, from causes probably connected with their mode of life, it has been comparatively mild. In the memory of the oldest Indians, this epidemic has occurred amongst them twice before, and is peculiar to the cold months in this climate."

Dr. Samuel Willey contributed to the *Cincinnati Lancet and Observer* for April, 1856, a well written clinical observation on a case of gangrene of the right lung.

There is also a paper by the Rev. Samuel W. Pond, an early missionary, to be found in Volume XII of Collections of the Minnesota Historical Society entitled, "The Dakotas or Sioux in Minnesota as they were in 1834," giving considerable information as to the diseases of the Indians. He states that insanity and idiocy were rare. A very valuable paper by Dr. David Day dated Winnebago Agency, July 5, 1852, on the diseases of the Indians (Report of the Surgeon General, U. S. Army, in Senate Documents, 1st session 34th Congress, Vol. 18, 1855-56) and other reports from medical officers stationed in Minnesota, may, of course, be found in the Surgeon General's Reports.

A survey of the articles by Finch, Williamson, and Pond reveals that the diseases prevalent in Minnesota at this period differed but little from those prevalent today, except that typhoid fever and intestinal affections have almost disappeared due to the construction of sewers, an uncontaminated water supply, and improvement in the feeding of infants. Cholera, of course has disappeared. Pneumonia was perhaps much more common then, due to the discomforts of the inadequate housing and heating of those days. Most of the old settlers kept warm by wearing buckskin underwear. Scurvy has practically disappeared and probably never will appear again. Perhaps many of the cases denominated scurvy in those days we should now call pellagra. In the early days, when navigation closed on the river there was practically no communication with the outer world as far as the securing of provisions was concerned. In the early fifties, a stage line ran to Galena, where there was a rail connection with Chicago, but little freight could be moved in this way. The late Mrs. Robert P. Lewis stated that she received from her father a present of a gold dollar for Christmas, 1849, and was told that she could buy for herself anything she wished with it. After much deliberation she purchased two eggs to eat on New Year's. The late Mrs. T. C. Schell said that in the winter of 1852 she had a severe cold and expressed the desire for a hot lemonade. Her husband (she was then Mrs. Charles H. Oakes) scoured the town and finally succeeded in purchasing the last lemon in the place, for which he paid fifty cents. Fresh food was so scarce and whiskey so cheap that it is no wonder that deficiency diseases as well as gastric disorders were much in evidence. Protein diet consisted largely of salt pork, although game was abundant, and venison and bear meat offered some variety during the winter. Williamson mentions typhomalaria, a term used indiscriminately in those days, and even much later, for many types of fever and intestinal febrile disorders. It is doubtful if the true malaria was endemic in Saint Paul. No doubt cases were imported by way of the river boats from the south, and during some years it was quite prevalent along the river. Cholera, of course, was imported in this way. Smallpox and measles were common enough. Tuberculosis was comparatively common, inasmuch as many people came to Minnesota to enjoy the advantages of the climate as a cure for that affection. Perhaps it was no more common than in other parts of the country at that time. In the early days our population was made up of the young, the sturdy, and the adventurous, and in the later years of the period housing conditions were better and compared favorably with housing conditions in other parts of the country. Though considered good at that time, living under the same conditions would be considered decidedly unbearable today.

Daniel Drake, in his great work "The Principal Diseases of the Interior Valleys of North America" (1854), says nothing about malaria here, and Ramsey in his inaugural address to the legislature in 1858 denies its existence in Minnesota. As to the treatment of disease employed by our early physicians, one cannot go into great detail. The best of these men were well qualified and compared favorably in the quality of their work with those elsewhere. There are in the Ramsey County Medical Library many books bearing the autographs of our pioneer physicians. Among those published before 1860, which were used for reference, the following may be listed:

Surgery—Dorsey, Gibson, Smith, Druitt, Pancoast, Bell, Cooper, and Miller.
Obstetrics—Dewees, Meigs, Hodge.
Therapeutics—Chapman, Eberle.
Gynecology—Dewees, Eberle.
Pediatrics—Dewees.
Medicine—Thomas, Chapman, Good.
Chemistry—Webster, Henry, Hare.
Anatomy—Horner, Wistar, Bell, Smith, Horner's Atlas.

Other books, Beaumont, Rush's works, some of Holmes' essays, Buchan's "Domestic Medicine," some works on insanity belonging to Willey, and several on venereal disease and dermatology are deserving of mention.

It will be noted that most of these books are by Pennsylvanians. There are several reasons for this, as most of our early physicians came from Pennsylvania or from the West where the Pennsylvania influence was dominant. This applies particularly to Saint Paul. No doubt the fact that Governor Ramsey was a Pennsylvanian attracted many from his former home. Those who came from New York or New England left no books which have come to us. The

American Journal of the Medical Sciences, the *Chicago Medical Examiner,* the *Ohio Medical and Surgical Journal,* the *Boston Medical and Surgical Journal,* the *Transactions of the American Medical Association,* various Cincinnati journals and the *Buffalo Medical Journal* were periodicals read by Saint Paul practitioners.

A perusal of the works to be found in any medical reference library will reveal the medicine of the period. One does not have to be told that there were no synthetic drugs. Calomel, iodides, iron, arsenic, antimony, and lead were the principal minerals used, though large doses of the last three were being discarded. Opium, quinine, digitalis, squills, ergot, and the balsams were the leaders among the vegetable drugs, and a host of other tinctures, extracts, decoctions, and tonics, of much vaunted excellence, were popular, but are now rarely used. The most unfortunate fact of the medicine of this and previous periods was that there was but one drug for the relief of pain—opium. Even if we had but this one drug now, surgery has so advanced that its use would be much more limited. Habitual use of opium and morphine was more common then, both among the people and among some of our early physicians. Also the drug could be purchased by anyone without restriction. Some irregular practitioners gathered vegetable drugs from the woods and fields, but for the most part medical men relied upon prescriptions mixed by pharmacists.

It is believed that the name of every physician practicing in Saint Paul up to this date has been given, and that something is known about most of them. Certainly those of whom little or nothing is known occupied no conspicuous or even mediocre place in the history of medicine in Ramsey County.

1860

In the manuscript division of the Minnesota Historical Society is a photostat copy of the federal census of 1860. This gives name, age, sex, social status, occupation, amount of real estate and personal property, and nativity. The names of persons in the medical profession are given below.

Saint Paul

Name	Age		Born
C. Knapp	60	Surgeon	Mass.
John Steel	50	Physician	Penn.
John J. Dewey	38	Physician	N. Y.
H. Wedelstadt	40	Physician	Lithunia
Alfred Berthier	37	Physician	France
Wm. H. Morton	32	Physician	S. C.
Joseph E. Tertl	28	Physician	Canada
H. N. Bushnell	31	Physician	N. Y.
E. Braun	39	Physician	Canada
Francis Hoffman	28	Physician	France
Wm. Caine	38	Physician	Isle of Man
Thos. R. Potts	50	Physician	Penn.
Gustav Rosenk	42	Physician	Prussia
Francis Rieger	29	Physician	Prussia
Franklin R. Smith	57	Physician	Penn.
Wm. H. Miller	56	Physician	Hanover
F. W. Fusshoetter	28	Physician	Prussia
Sam. Willey	32	Physician	Mass.
D. W. Hand	26	Physician	N. J.
Wm. H. Schell	37	Physician	England
G. A. Vervais	35	Physician	Canada
J. H. Steward	30	Physician	N. Y.
Alfred Wharton	26	Physician	Penn.
A. G. Brisbine	37	Physician	Ohio
Rudolph Albertez	35	Physician	Prussia

New Canada Township

R. Post	60	Physician	Conn.
Edward Boyd	38	Physician	Maine

It will be noted that the list numbers twenty-seven. The omission of Dr. David Day's name cannot be explained. St. Anthony, though still part of Ramsey County, has not been included in the list. Steel should be Steele; Schell's name was Thomas Chatterton Schell. He came here in 1859. G. A. Vervais should be J. A. Vervais, and Albertez should be Alberti. Fusshoetter should be Hostetter. Drs. Mann and Phillips were then living on their farms at Cottage Grove. It will be noted also that the average age of the group is less than thirty-five years. Four of the group were homeopaths (Bushnell, Caine, Schell, and Boyd); and four were irregular practitioners (Rosenk, Miller, Alberti, and Post). No information as to the standing of Knapp, Berthier, Tertl, Hoffman, and Hostetter, is at hand. From other sources it seems probable that the name Tertl should be Hyrtl and that Berthier was a French Canadian, though he claimed to have been born and educated in France. Lithunia should be Lithuania. According to a personal communication believed to be reliable, Hostetter had a saloon on Seventh and Broadway and was the originator of Hostetter's Bitters. He went back to Philadelphia and made a fortune out of his bitters. The late Frank Werner, long connected with the police department, used to help Hostetter make them. Cyrus Knapp apparently was a legitimate practitioner but nothing is known about him. The census showed the population of the city to be 10,279; the entire county contained 12,150 persons. Of the inhabitants of Saint Paul, almost one-half were of foreign birth (4,659). This well illustrates the immigration to our state and city. Of the twenty-seven physicians listed, almost half of them were foreign born. As to the financial standing of these men, J. H. Stewart, whose name is also spelled wrong, was listed as the best off in worldly goods, his property being valued at $40,000. It is a noteworthy fact that in Saint Paul there was one physician of every kind to about every 400 people. Among the foreign names the French still predominated, though Germans were on the increase.

The year 1860 brought no great change in the personnel of the medical profession in Saint Paul as may be seen by the census. Late in the year two more physicians arrived who essayed the practice of medicine in Saint Paul—Dr. D. McCrae from St. Louis, and a Dr. Caldwell who advertised himself as an eye and ear specialist. The cards of these men in the papers are modest announcements, and they were probably legitimate practitioners. The year marks the beginning of local medical societies in Saint Paul. An institution called the Free Hospital for the Poor was established on the corner of Eighth and Jackson Streets in February under the auspices of the ladies of St. Paul's Episcopal Church, then under the leadership of Dr. Patterson. It was hardly a hospital at that time but rather a home for the aged and infirm which served free meals to the indigent and to poor children. More will be said of it later. It is true that a similar institution was started earlier, but there is some confusion as to the relations of the two institutions. The Saint Paul Academy of Medicine and Surgery was formed this year, being, as stated above, the first local medical society. The *Pioneer Press* of April 15, 1860, published a letter to the city council signed by Drs. T. R. Potts, W. H. Morton, and A. G. Brisbine, asking that body to elect Dr. Thomas R. Potts, President of the Saint Paul Academy of Medicine and Surgery, to the position of city physician and health officer.

1861

During the years of the war medical men in Ramsey County took an active part in military affairs. On April 29, Dr. J. H. Stewart and Dr. C. W. LeBoutellier, of St. Anthony, were appointed, by the Governor, surgeon and assistant surgeon respectively to the First Regiment, and on June 15, Dr. T. R. Potts, Dr. J. H. Murphy, of St. Anthony, and Dr. D. C. Patterson, of Winona, were appointed to serve on a state board to examine into the fitness of candidates for appointment to medical positions in the army. Drs. Stewart and LeBoutellier were taken prisoners at Bull Run, and Dr. D. W. Hand was appointed July 25 to take LeBoutellier's place, as it was falsely reported that LeBoutellier had been killed. On October 4, Doctor Braun was appointed post surgeon at Fort Abercrombie. Stewart and LeBoutellier were paroled and Hand rapidly advanced, receiving an appointment as brigade surgeon on October 8. Potts was appointed post surgeon at Fort Snelling, and Foster served as commissary of subsistence with the rank of captain, a position which he held throughout the war. The state board for the examination of medical officers was now replaced by a federal board consisting of Dr. Gale of Minneapolis, Dr. Reiner of Marine, and Dr. Finch of Hastings. Dr. J. H. Murphy, of St. Anthony, on December 8 was appointed surgeon to the Fourth Regiment. On December 10, Hand telegraphed Morton to come at once as surgeon to the First Regiment. Hand, as brigade surgeon, was authorized to do this, but the appointment had to be confirmed by the governor. There was considerable opposition at home to Morton's appointment because he was a Democrat, but Hand assured the governor that Morton was capable, and asserted, in addition, that the men liked him. It would seem that every man in Minnesota who had a following attempted to raise a company of troops; among them was Doctor Rosenk, who wished the authority to recruit an artillery company. He stated that he had served two years in Russia and nine years in the Prussian artillery. George McDonald Lambert, who had been in the drug business, received an appointment as hospital steward in the Fourth Regiment. He was a son of Judge Lambert.

Apparently but two new physicians came to Saint Paul this year. They were Professor C. D. Williams, late of the Western College of Homeopathy at Cleveland, Ohio, who went into partnership with Dr. Wm. Caine; and a Dr. Adams, also a homeopath. In January, 1861, a Dr. D. B. Reid came to Saint Paul for his health and gave a series of lectures on practical chemistry. The Saint Paul Academy of Medicine and Surgery gave him the use of their rooms and laboratory for this purpose. More shall be said of Dr. Reid later.

The *Pioneer* for April 9 contains an item of considerable interest which deserves to be quoted in full:

> The Annual Supper of the Saint Paul Academy of Medicine was attended last night by nearly all the practitioners in the city, with their guests, the Mayor and Aldermen and representatives of the Press. It was a most enjoyable occasion, to the guests at least, who found the prescriptions of the doctors not "bad to take" and productive of healthful exhilaration.

In April the Christ Church Orphans Home and Hospital was reopened, having been closed for a short period; Dr. Brisbine and Dr. F. R. Smith constituted the medical staff. The papers, early in the year, announced that there was considerable hydrophobia among dogs in the southern part of the State; in May the disease reached Saint Paul and an order was issued to destroy all stray dogs. This order seems to have been effectively carried out and we hear no more of rabies in the city. In the early autumn Judge Lambert complained to the authorities that the Indians were killing large numbers of deer about White Bear Lake in violation of game laws.

(To be continued in March issue)

President's Letter

THE program of the month on pneumonia received a surprising number of requests for additional information. February will deal with Pediatrics in general and especially with acute upper respiratory diseases, immunization and winter diets for children. In Minnesota we want to continue to emphasize the fact that high scientific standards and advancement of the public health combined, constitute our prime consideration. During the past month, however, we have turned our attention to social and economic phases also, and especially to government medicine. On January 14, an informative meeting was held where the workings of government medicine as it exists in European countries and in our neighboring state of South Dakota were portrayed by Mr. J. G. Crownhart, Madison, Executive Secretary of the State Medical Society of Wisconsin and Dr. B. A. Dyar of Pierre, South Dakota, Secretary of the Allied Professional Council, followed by Dr. C. B. Wright, Minneapolis, Dr. W. A. O'Brien, Minneapolis, Dr. A. Kuhlmann, Melrose and Dr. J. M. Hayes, Minneapolis. Dr. Gilbert Cottam, Minneapolis, opened the meeting with a talk on Americanism. Questions were raised by Dr. W. A. Coventry, Duluth, Dr. C. L. Oppegaard, Crookston, Dr. I. L. Oliver, Graceville, Dr. A. K. Stratte, Pine City and others.

The meeting gave us a picture of the problems involved in government and socialized medicine. Some felt that it struck a pessimistic note since no definite counter-program was suggested, but there was no time on this occasion for more than a factual presentation.

In Minnesota, experiments with group hospitalization insurance, a form of socialized medicine, are already underway. Private hospital insurance is also having a considerable sale. Many think that extensive hospital insurance would care for a large part of the immediate problem of the cost of illness and that if hospital service can be provided, other medical costs can be adjusted.

So far as insurance for medical care is concerned there are, after all, only a few methods of operation. One is by outside insurance companies. Another is by county or other local medical groups who organize non-profit services for their communities. Such services are being developed now in Cleveland, Michigan, Utah, Denver, California and New York. In our neighboring state of Wisconsin, in Douglas County, in which Superior is located, one of three experiments has been authorized by the State Medical Society. According to the Douglas County plan for a certain fee per month, members of the county society are going to attempt to give medical service to a local coöperative group. A third is by benefit societies, which have tried from time to time to provide medical services, including those in Los Angeles, Arkansas and other places that we have read about so extensively. Fourth, there is compulsory government health insurance.

Enumerations such as this simply call to our attention the tremendous amount of study needed. Realizing the difficulties involved, any proposed changes in our present system will be most carefully weighed by the profession of Minnesota.

Perhaps the continued orderly development and extension of services may continue here in the future as in the past, particularly as public health statistics prove Minnesota has achieved a place at the top. Certainly Minnesota, less than any other state, needs a radical change in its system of medical care.

George Earl, M.D., *President*
Minnesota State Medical Association

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BUSINESS MANAGER
J. R. BRUCE

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OXYGEN IN AVIATION AND THERAPEUTICS

AS THE result of the work of numerous investigators, especially that of Barach[3] at the Presbyterian Hospital in New York, of Boothby[5] at the Mayo Clinic and of Waters[12] at the University of Wisconsin, oxygen has been used more and more extensively in the past few years for the treatment of anoxemia due to deficient saturation of the hemoglobin with oxygen from the lungs. Such anoxemia occurs in pneumonia, pulmonary edema and certain types of congestive heart failure. However, relatively scant attention has been paid to the use of oxygen in the treatment of anoxemia resulting from four other conditions. The first of these is the deficiency in mass of available oxygen that arises from diminution of physiologically efficient hemoglobin. Such diminution occurs in all types of anemia. In the second of the four conditions, anoxemia results from defective circulation; that is, the passage of blood through the capillaries is so slow that the oxygen is used up to an excessive extent. This state occurs in severe hemorrhage, surgical shock and certain types of heart disease. Third is histotoxic anoxemia wherein even if the pressure of oxygen in the tissues is normal, the cells cannot take up and use the oxygen; examples are poisoning from hydrocyanic acid, cyanide or alcohol. The fourth condition in which high concentration of oxygen is beneficial is in the treatment of patients suffering from the results of infection with an anaërobic or semi-anaërobic type of organism, as, for example, gas gangrene, in which local anoxemia is always present.

The extent of the damage to important organs and the possibility of this damage being repaired depends directly on the severity and duration of the lack of oxygen. Consequently, administration of oxygen must be started early and be continued for as long as is indicated, not only to ward off the cause of harm to the patient but also to give the body time to recover from the original cause of oxygen want or to give it time for adaptation.

The common clinical signs of lack of oxygen are cyanosis, which may be absent in anemia and often is difficult to perceive; a respiratory rate higher than 30 per minute; orthopnea and Cheyne-Stokes breathing; an increased pulse rate and restlessness and mild delirium. The clinical criterion of successful administration of oxygen is gradual disappearance of the foregoing signs.

The effects of lack of oxygen in disease are similar to its effects at high altitudes such as can be reached in airplanes. As a consequence of the rapid development of commercial and military aviation during the past decade there has been an increasing number of flights of several hours' duration, at altitudes above the critical point of

10,700 feet. Barach,[2] in his paper, "Pilot Error and Oxygen Want," emphasized the dangers that could arise from the anoxemia to which normal individuals are known to be susceptible at such altitudes; he pointed out, also, the possibility of accidents resulting therefrom. Armstrong and Heim found that exposure of normal subjects to a simulated altitude of 12,000 feet for four hours daily for twenty-six days produced concurrent mental and physical fatigue after each exposure, that these signs persisted for twenty-four hours and that they were manifested by difficulty in concentration, retention of ideas and attention over periods of time in excess of a few minutes. There was no evidence of acclimatization. Boothby and Lovelace[7] set the critical level at which a normal individual begins to suffer from tissue anoxemia at only 10,700 feet because at this point an appreciable decrease becomes manifest in the oxygen saturation of the hemoglobin of the arterial blood. Passengers with known, or perhaps unknown, cardiac or respiratory disease can experience serious or even dangerous evidence of anoxemia at much lower elevations.

One of the difficulties in supplying oxygen to counteract the effects either of high altitude or of disease has been lack of apparatus to deliver oxygen efficiently and economically. Boothby and Lovelace[7, 10] and Bulbulian recently have contributed to solution of these difficulties. They have designed a simple and efficient apparatus now known as the "B.L.B. inhalation apparatus." It consists, in part, of a nasal or oronasal type of mask and a reservoir-rebreathing bag. This device makes it possible to supply oxygen to both pilots and passengers and to maintain them at sea level conditions with a very small flow of oxygen. The apparatus has been found satisfactory and practical by flight tests made on commercial airlines, by several noted pilots, and at the Army Physiologic Research Laboratory at Wright Field in Dayton, Ohio, to a simulated altitude of 35,000 feet. The apparatus is equally applicable for the therapeutic administration of any desired concentration of oxygen up to 100 per cent and also for administration of any desired concentration of helium and oxygen mixtures. The cost of administering 50 to 60 per cent oxygen with this apparatus is about a fifth of what it is with the ordinary oxygen tent.

Possession of an efficient and economical apparatus for administration of gases stimulated Boothby and Lovelace[6, 7] to take up again work which once had been a major interest of the senior investigator. They confirmed the work of Fine and his co-workers that, in the majority of cases, the inhalation of 100 per cent oxygen would decompress the distended abdomen within twelve to twenty-four hours. However, they found that much better results were obtained when oxygen therapy was used in conjunction with Wangensteen's method of suction or drainage, employing the Miller-Abbot tube. In addition, they confirmed the work in which Fine and his associates demonstrated that the intense headache which ordinarily follows encephalography can be alleviated in about 80 per cent of cases by inhalation of pure oxygen for four to six hours. No ill effects have been observed as a result of breathing pure oxygen for as long as two days. On account of the possibility of pulmonary irritation from long continued administration of high concentrations of oxygen, it should not be used continually for longer than two days.

The inhalation of 100 per cent oxygen reduces the nitrogen partial pressure in the lungs to practically zero and, as a result, the nitrogen in the blood diffuses into the alveoli and is then expired, since gases always diffuse from a region with a higher pressure to a region of lower pressure of the particular gas. In the same fashion the resulting reduced partial pressure of nitrogen in the blood allows this gas to diffuse more rapidly from any body cavity, such as the intestines, subarachnoid space and ventricles, into the blood and thence into the alveoli of the lungs. Behnke and his co-workers have shown that 99 per cent of the nitrogen normally present in the body is eliminated in nine hours and a little more than 90 per cent in four hours. Inhalation of pure oxygen causes the hemoglobin to be completely saturated instead of only 95 per cent saturated. In addition, the amount of oxygen in simple solution will be increased about seven times. The combination of these two factors results in a 10 to 15 per cent increase in the amount of oxygen in the arterial blood.

The use of 100 per cent oxygen as an adjunct in the treatment of surgical shock was advocated by Boothby[6] and Lovelace[10] because of this increase of 10 to 15 per cent of oxygen in the circulating blood and an even greater increase in the oxygen pressure in regions where local anoxemia has resulted from edema or stasis. Moon defined shock as "a circulatory deficiency, neither cardiac nor vasomotor in origin, characterized by decreased blood volume, decreased cardiac output and by increased concentration of the blood." He stated, further, that anoxia of the blood and tissues is a factor of utmost gravity in the operation of the vicious circle associated with shock.

Since transfusion of blood is often given in surgical shock to increase the oxygen-carrying power of the blood, and as a means of increasing the circulating blood volume and of elevating the arterial pressure, Boothby[6] and Lovelace[10] suggested that the combination of blood transfusion and inhalation of 100 per cent oxygen almost always would be indicated in the treatment of severe shock, since both measures increase the oxygen-carrying power of the blood. They have reported cases of mild surgical shock in which great benefit followed inhalation of 100 per cent oxygen without transfusion.

Mann and his associates have demonstrated that placing an etherized animal in the shock position increases the blood flow in the carotid artery 30 per cent; this would seem to explain why there is often an almost immediate improvement in the mental condition of a patient in shock when placed in such a position because of the increased oxygen pressure thereby produced in the cerebral tissues by the increased rate of blood flow. Other conditions treated with apparent benefit by the use of high concentrations of oxygen have been gas gangrene, tetanus, acute coronary thrombosis in its early stages, angina pectoris, pulmonary embolism, massive atelectasis and acute alcoholism. Several patients with migraine have been benefited by the inhalation of pure oxygen, according to Lovelace. When there is moderate to severe secondary anemia and it is necessary to carry out a major surgical procedure, it is advisable to administer oxygen postoperatively in order to decrease the demand on the circulatory system and to prevent localized anoxemia at the site of operation.

Because of the circulatory disturbance and anoxemia associated with seasickness, Boothby, in coöperation with Goulden, surgeon of the Canadian National Steamship Company, recently tried out the value of 100 per cent oxygen in four cases. The greenish ashen pallor, so characteristic of the seasick patient, disappeared immediately in all of the cases and marked relief, amounting to practical disappearance of vertigo, nausea and vomiting, was effected in three of four cases; there was only slight improvement in the nausea and vomiting in the fourth case although the patient "felt better."

With the B.L.B. apparatus, treatment of patients who have mild or severe asthma with helium and oxygen mixtures is rendered practicable, efficient and relatively economical. The helium and oxygen mixtures are also of great aid in the treatment of patients with severe emphysema and pulmonary fibrosis, acute pulmonary edema and all mechanical types of respiratory obstruction in the trachea and bronchi. Tracheotomy sometimes can be avoided.

W. Randolph Lovelace, II, M.D.

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SENSITIVITY TO SULFANILAMIDE

VALUABLE, yes, even life-saving as sulfanilamide has proven itself to be in the treatment of a variety of infections, it cannot be too strongly emphasized that an appreciable percentage of individuals show a sensitivity to the drug.

It is not uncommon for symptoms such as malaise, headache, nausea, diarrhea, and cyanosis to make their appearance. With discontinuance of the drug, there is a rapid disappearance of symptoms.

Reports have appeared, however, of more severe symptoms resulting from sensitivity to the drug. High fever with or without chills, hemolytic anemia rapidly appearing after a day or two of medication, agranulocytosis and jaundice have been reported.

It is important, therefore, that patients be seen daily while sulfanilamide is being administered. Fortunately, the drug is rapidly eliminated through the kidneys, and most patients recover promptly from effects of the drug.

Certain precautions in the use of sulfanilamide may be emphasized. The drug should not be given to patients suffering from nephritis or liver disease. It should be administered with sodium bicarbonate to compensate for the increased elimination of sodium by the kidneys and to minimize the development of acidosis, which sometimes appears. Magnesium sulphate should not be given a patient receiving sulfanilamide, as it favors the production of sulfhemoglobinemia. Cathartics and excessive fluid intake, of course, minimize the effect of the drug.

Sulfanilamide is the name given by the Council on Pharmacy for paramino-benzene-sulfonamide. It is the same preparation as that which came out first as prontolin. Prontosil is a 2.5 per cent solution of an allied drug of complicated formula, supplied for parenteral administration. The name neoprontosil is now used to designate the preparation of prontosil, which is supplied not only in solution for parenteral injection but also in five-grain tablets for oral use. Neoprontosil is said to be less toxic and as effective as sulfanilamide in similar doses, although it gives off only a small percentage of sulfanilamide in the tissues. It is, therefore, concluded that its effectiveness is not entirely due to its sulfanilamide content.

It can be safely said that the addition of sulfanilamide to our armamentarium marks a milestone in the progress of therapeutics. This drug, however, must be used with caution.

TOPICS OF THE MONTHS

IN OUR December issue we mentioned editorially the proposal of our new president, Dr. George Earl, to institute a combined preventive medicine campaign in Minnesota of lay and professional education, known as the "Indiana Plan." The proposal having met with the approval of the officers of the component societies, and the various committees of the State Medical Association, the various agencies will presumably join in the combined attack. It will undoubtedly take some time for the program to get in full swing. The journal will coöperate as far as possible in emphasizing in successive numbers the subjects chosen.

January—Pneumonia and Respiratory Diseases
February—Pediatrics
March—Degenerative and Circulatory Diseases (including heart and kidney disease and diabetes)
April—Cancer
May—Obstetrics and Gynecology
June—State Board of Health
July—University Hospital
August—State Board of Control
September—Traumatic Surgery (including highway accidents, first aid, et cetera)
October—Syphilis and Gonorrhea
November—Tuberculosis and Respiratory Diseases
December—Anemia and Deficiency Diseases (including vitamin therapy).

POISON GAS

AT the Peace Congress held at The Hague in 1907 the subject of the employment of poisonous gases in warfare was discussed very thoroughly and the decision was finally reached that this method of warfare was inhumane and against the laws of civilization. There was but one dissentient and that was our own representative, Captain A. T. Mahan, U.S. N. retired, who gave reasons for his objections in terms which since, in the light of later experience, have proved to be thoroughly justified.

When the German Army first used gas in the form of chlorine in a surprise attack against a division of French Colonials brigaded with Canadians at the second battle of Ypres in 1915 the world was horrified but before long both sides were straining their ingenuity to find more potent and efficient gases and these were used freely, chiefly in artillery bombardment, up to the end of the war. The chemicals found most useful in producing casualties were phosgene gas and the so-called "mustard," a heavy, volatile, oily liquid which emitted a peculiar smell suggestive of garlic or onions. Along with these were used tear and sneezing gases, principally for the purpose of interfering with the use of masks and thereby permitting the more lethal reagents to be inhaled.

Long before the close of the World War, military men and medical officers in all the armies became fully aware that the effects of these gases and chemicals had been greatly over-estimated. The immediate death rate among those exposed was very low and the ultimate after-effects practically negligible. The military value of Chemical Warfare, as it came to be designated in our army, consisted in its ability to upset the morale of troops and make temporary casualties of them. The French Colonials, mostly Senegalese, simply broke and ran in that first attack; the Canadians were able to hold their share of the line.

In our army the official figures covering all hospital admissions of battle injuries during our participation in the war show the following:

Total battle casualties hospitalized..	224,089
Of these, due to war gas, were......	70,552, or 31.4%
All others	153,537, or 68.6%
Deaths, war gas	1,221, or 8.9%
Deaths, all others	12,470, or 91.1%

After the war a very thorough investigation of the whole subject was made by the Chemical Warfare Service, the Surgeon General's Office and the Medical Research Laboratories of the Edgewood Arsenal, Maryland. The results of this study, as well as a summary of the reports of the British, French, German and Polish authorities, are set forth in *Army Medical Bulletin* Number 16 published in 1925 at the Medical Field Service School, Carlisle Barracks, Pennsylvania, in 115 pages. The conclusions, epitomized by Colonel H. L. Gilchrist, Director of the Chemical Warfare Service, himself a medical officer, are worth quoting: "The results attributed to the effects of warfare gases have been greatly exaggerated and this weapon is credited with more dire iniquities than have ever been associated with any other war weapon. . . . From the evidence thus far obtained it seems to be the consensus of opinion among medical men, not only in this country but also in Europe, that as a general rule there are comparatively few after-effects of warfare gases." The magazine *Time* recently quoted Dr. Francis Arthur Freeth, chief research chemist of Britain's Imperial Chemical Industries, as saying: "The amount of nonsense talked about poison gas is beyond belief."

All of which goes to indicate that there is no basis whatever for any undue excitement, much less hysteria, over any widespread danger from attack by poison gas.—G.C.

TUBERCULOSIS RESEARCH

APPROPRIATIONS for research in the study of tuberculosis during the coming year have been made to six leading universities in various parts of the country by the National Tuberculosis Association, according to an announcement received by the Minnesota Public Health Association from Dr. William Charles White, chairman of the Medical Research Committee. One hospital, Mt. Zion in San Francisco, California, also receives an appropriation for special laboratory work. This research is but one phase of the program financed by the National Tuberculosis Association's share of the five per cent of the funds raised through the sale of Christmas Seals in each state.

"Yale, Columbia, Cornell, Vanderbilt, Pennsylvania and Wisconsin universities will coöperate with us in our endeavor to achieve our final goal, the eradication of tuberculosis," said Dr. White. "Medical research will continue to be one of the strongest battle-lines against tuberculosis in 1939."

Two projects are now under way at Yale. Further study of the chemistry of the tubercle bacillus, the germ which causes tuberculosis, is being conducted by Dr. R. J. Anderson of the Department of Chemistry. Dr. Robert Thomas is in charge of another which deals with the physiological aspects of the substances of the tubercle bacillus.

The University of Wisconsin, under Dr. Horace Getz, will pursue research to determine the ingredients of cod liver oil which make it valuable in the treatment of tuberculosis. At Cornell, the biology of the tubercle bacillus inside living cells will be studied microscopically by Dr. Morton C. Kahn.

At Henry Phipps Institute of the University of Pennsylvania, further study of tuberculin will be continued with a view to establishing a more completely standardized product. Dr. Florence B. Seibert, recipient of the Trudeau Medal in 1938, is working on this project. The Moore School of Electrical Engineering of the University of Pennsylvania, under Dr.

F. Maurice McPhedran and Prof. Charles Weyl, is engaged in the improvement of x-ray technic.

It has long been known that in diabetics, tuberculosis runs a rapid and intensive course. Research to learn the causes back of this relationship will be conducted by Dr. M. Maxim Steinbach of the Columbia University Medical School. Dr. Steinbach will also direct his efforts to a study of increased susceptibility to tuberculosis during puberty and among schizophrenics. The chemistry of the proteins and carbohydrates which are contained in the tubercle bacillus will also be taken up at Columbia by Dr. Michael Heidelberger.

A joint study on the causes of calcifications appearing in x-ray plates in the human lung, which resemble those found in healed tuberculous lesions, will be conducted at Vanderbilt University under the direction of Dr. Henry C. Sweany.

Dr. Charles Weiss of Mt. Zion Hospital in San-Francisco will correlate findings in that institution on the active chemical principles in the white blood cells found in pleural fluid.

This program, which benefits every state through the development of new knowledge and technic for fighting tuberculosis, is but one phase of the program of the National Tuberculosis Association financed through the five per cent of the Christmas Seal sale received from each state. In Minnesota, the ninety-five per cent of the proceeds of the seal sale retained in the state makes possible specific projects in each county and a far-reaching state-wide program, including tuberculin testing and x-ray surveys of school children, sanatorium follow-up nursing service, health inspection and medical examination of school children, clinics, short courses on tuberculosis and x-ray consultation service for doctors, and an extensive campaign of child and adult education.

The Interstate Service

The Bureau of Investigation of the American Medical Association reports that a concern known as the Interstate Service at 111 West Jackson Boulevard, Chicago, appears to be writing to physicians with the hope of developing private prescriptions into nostrums. Part of the promotional letter reads:

> "How often have you thought of a favorite and unusually effective prescription that you would like to make available to the general public? One that could take its place with many of the proprietary preparations now generally on sale. . . . Let each specialist keep within his field. And only by collaboration can the greatest good be achieved. We address you, a physician, as specialists in the field of mail-order selling. And, as such, we say that the cost of launching such a venture is moderate. You provide the formula. It is our business to help sell it for you."

No reputable physician would, of course, lend his services, knowledge or personal treatment to such a performance. It is a peculiar form of stupidity that would lead a promoter to put out such an appeal at a time just after the new Wheeler-Lea and Food and Drug legislation have been passed. (J.A.M.A., Dec. 24, 1938, p. 2409.)

In Memoriam

Lewis Nelson Klove

1872-1938

DR. LEWIS N. KLOVE, a resident of Minneapolis for many years, died in November of a heart affliction at the age of sixty-six.

Dr. Klove was born May 22, 1872, at Northwood, Iowa, of Quaker stock. He attended Grinnell College, Iowa, and received his M.D. from the University of Minnesota Medical School in 1903. After taking his interneship at the Swedish Hospital in Minneapolis, Dr. Klove practiced for several years in Minneapolis. He then practiced for seven years in Wanamingo, three years in Chokio, and later in Kensington and Wright, all located in Minnesota, returning to continue practice in Minneapolis in 1929.

Surviving him are his wife, Celia, whom he married on June 8, 1910, and two sisters, Mrs. Ed. Thone of Kindred, N. D., and Mrs. Ida Stewart of Missouri.

Irving C. MacDonald

1874-1938

DR. IRVING C. MACDONALD was born in Minneapolis, Minnesota, on March 16, 1874. He attended the grade schools in Minneapolis and then moved to Grand Forks, North Dakota, where he received his high school education, as well as his college education at the University of North Dakota. He was principal of the Buckston High School from 1895 to 1898. He gave up this position to enter the University of Minnesota Medical School from which he graduated in 1902. After completing his year of interneship at St. Barnabas Hospital he located in North East Minneapolis.

In 1920, Dr. MacDonald married Miss Agnes Smith. In 1930, he moved his office to the Medical Arts Building where he practiced up to the time of his death. He had been a member of the Staff of St. Barnabas Hospital for over twenty years and was Chief of Staff two years ago. He was a physician for the Northern Pacific Railway for a number of years. He was a member of the Hennepin County Medical Society, American Medical Association, Alpha Kappa Kappa, Masons, Scottish Rite, and Shriners, also a member of the Lafayette Club. He was a member of the Presbyterian Church.

Dr. MacDonald had not been very well the last few years of his life. He was taken sick late Sunday, December 3rd, 1938, and died Monday night at 11:30 p. m. He was partly conscious for a few hours only.

Dr. MacDonald was a conscientious and trustworthy physician with good judgment and his patients had great confidence in him. He was particularly skilled in obstetrical work having attended over 3,400 confinement cases during his years of practice, and lost but two mothers during this time. He began his practice in the horse and buggy days and drove a good team. He was always equipped and ready to respond to any emergency calls night or day. When the autos appeared on the streets of Minneapolis, he was one of the first to recognize their value as a means of transportation for physicians and purchased one of the contraptions, a Ford Car, No. 916, the first of that make in the state.

Dr. MacDonald was sociable and well liked by his conferrers, even tempered, agreeable, and enjoyed a good story. We will all miss his company. We have lost a friend and his patients a good physician.

Dr. MacDonald was sixty-four years of age at the time of his death. He is survived by his wife Agnes, and son John, aged seventeen.—A. E. Benjamin.

Lewis K. Onsgard

1866-1938

Dr. LEWIS K. ONSGARD, a physician for the past forty-six years in Houston, Minnesota, died October 24, 1938, following a ten years' illness.

Dr. Onsgard was born near Spring Grove, Minnesota, January 1, 1866. He was reared on his parents' farm, educated in the public school, and attended the Eclectic Medical College at Cincinnati, Ohio, from which he obtained his medical degree when he was twenty-one years old.

After practicing five years in Harmony, Minnesota, Dr. Onsgard moved to Houston. On May 20, 1889, he was married to Miss Anna Laugen of Houston. He began his practice before the days of hard-surfaced roads and high-powered autos and his days and nights were filled with driving about on the country roads in bad and good weather. He untiringly gave of his ability for the welfare and improvement of his community. He served for many years as member of the board of health and coroner.

Dr. Onsgard was a charter and affiliate member of the Houston-Fillmore Medical Club, a member of the Olmsted-Houston-Fillmore-Dodge County Medical Society, the Minnesota Medical Association and the American Medical Association. He was an affiliate member of the Minnesota State Medical Association and Congress of Railroad Surgeons. Early in his career he was appointed as company surgeon for the Chicago, Milwaukee, St. Paul and Pacific Railroad Company and remained the company surgeon until his death.

Surviving Dr. Onsgard, in addition to his widow, are two sons, Orrin Onsgard and Dr. L. Kenneth Onsgard, who has his father's practice in Houston; three daughters, Agnes Onsgard of Houston, Mrs. A. M. Hanson of Albert Lea, and Mrs. P. F. Johnson of Houston; a brother, Martin Onsgard of Spring Grove, Minnesota; and a sister, Mrs. T. Jensen of Spring Grove.

Jerome F. Smersh

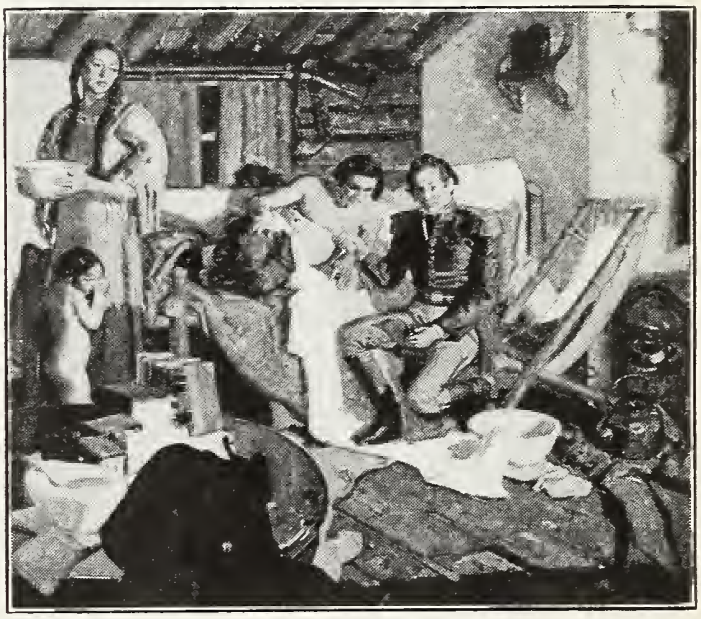
1892-1938

Dr. J. F. SMERSH, of Owatonna, died from pneumonia, October 27, 1938. A native of Owatonna and the son of the late Dr. Frank M. Smersh, he had carried on an active surgical practice there since May, 1919.

Dr. Smersh was born September 30, 1892, attended the public schools of Owatonna, and graduated from the Owatonna High School in 1911. He received his medical degree from the University of Minnesota medical school in 1917, and served his internship at the Ancker Hospital the following year. Entering the service, he spent a year as surgeon in the United States naval base hospital at Great Lakes, Illinois, attaining the rank of lieutenant, senior grade.

Dr. Smersh became president of the Board of Health of Owatonna in March, 1936, and was still serving at the time of his death. He became a member of the American College of Surgeons in October, 1936.

Dr. Smersh was married April 12, 1921, to Miss Ann Dapper of Faribault. Two sons, Jerome and Thomas, and a daughter, Rita, as well as his widow, survive; also his mother, who lives in Owatonna, a brother, Clement, and a sister, Mrs. Herbert E. Clefton, of Minneapolis.



Beaumont and St. Martin

"Beaumont and St. Martin" is the first of six large paintings in oil memorializing "Pioneers of American Medicine" which artist Dean Cornwell will complete in the next few years. Others in the series are: Dr. Oliver Wendell Holmes, Dr. Ephraim McDowell, Dr. Crawford W. Long, Dr. William T. G. Morton, and Major Walter Reed, and one woman, Dorothea Lynde Dix who, while not a physician, stimulated physicians to study insanity and feeblemindedness.

Arrangements to supply physicians with free, full color reproductions of "Beaumont and St. Martin" without advertising, and suitable for framing, have been made with the owners, John Wyeth & Brother, of Philadelphia, Pa. Send your request to Minnesota Medicine, 604 National Bldg, Minneapolis, or 2642 University Ave., Saint Paul.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
W. F. Braasch, M.D., Chairman

COMPLETE THE SURVEY

The National Health Program is now before Congress. Will it be shaped to meet the actual needs of the American people? Or will it be an extravagant and burdensome piece of legislation based upon doubtful studies and mistaken statistics?

Much depends now upon the Study of Needs and Supply of Medical Care of the American Medical Association.

The final form 1-F went out to all members late in January. This form provides for another daily record of medical services for the week, February 5 to 11, inclusive. When it is complete it should be sent to the Bureau of Medical Economics, American Medical Association, 535 North Dearborn Street, Chicago, Illinois.

This is the conclusion of the Survey and it should be filled out conscientiously by every member. Tabulations MUST BE COMPLETED by March 1, for report to the House of Delegates of the American Medical Association.

Let's complete the job in Minnesota!

FORUM ON MEDICAL CARE

Three hundred and sixty physicians and a group of dentists, hospital executives and social welfare workers attended the Forum on Medical Care, Saturday, January 14, at the Saint Paul Hotel.

Excerpts from the important talks made by visitors at that meeting, by Mr. J. G. Crownhart, secretary of the State Medical Society of Wisconsin and by Dr. B. A. Dyar, Pierre, S. D., executive secretary of the Allied Professional Council in charge of medical and health services in South Dakota, follow:

"No Profit . . ."

Mr. Crownhart: There is no profit to the physician in promoting anything that is not good for the public health.

We must be assured before we adopt any new plans for the delivery of medical care that they will in truth benefit the health of the people.

Conflicting Reports

Many conflicting reports have been brought back from England, Germany, and other European countries concerning the benefits or lack of benefits of their sickness insurance systems. The reason for these differences appears to lie in the fact that each inquirer goes armed with introductions to different departments and officials. The labor leader bears introductions to labor leaders who see the situation from one point of view; the social worker goes to the social service department and gets another point of view; the physician to physicians and secures still another version. Furthermore, these European systems are no longer experiments. They are established systems of many years' history. It requires time and painstaking inquiry to get at all phases of them. What you learn in the last 15 minutes of an interview may entirely change the conception gained in the first hour.

Out of many interviews it became evident to me that certain definite factors are common to all government systems. Presumably they would characterize any government sickness insurance scheme that might be set up in the United States also.

Premiums Are Fixed

The first is that insurance premiums are fixed. A definite percentage is taken from the employe's wage, and from the employer's payroll. A definite amount is added by the government.

This is the fund then, that must provide for medical care when the employe is ill, for limited care and compensation to the permanently invalided; for compensation for wage loss during illness.

We sometimes hear that we can have the medical care in the United States without the wage loss compensation or compensation for the disabled. It is the opinion of the International Labor Commission at Geneva, however, that it is impossible to have one of these three without the others.

Thus, there is a fixed amount to cover a threefold demand; but medical care is not a fixed item. Physicians do not remain in a groove. They develop x-ray, for instance, for diagnosis and treatment; they develop serums for control of disease and fever therapy.

No Money to Provide

These procedures are socially cheap. They save lives, prevent disability, but they are initially expensive and they require an outlay never anticipated in fixing premiums. Consequently, there is no money to provide for them.

The Administrator is obliged to balance his books and he does so by ignoring advances in medicine. His problem is this: On the one hand there is a fixed sum of money; on the other hand there is an unknown demand for medical service. No one has any idea how many people will be sick.

The physician must supply the unknown demand at so much per person per year and he, rather than the government, is the real insurer against this demand.

He Stays by the Book

He is supplied for the purpose with the "book." The book is a special pharmacopeia for insured patients and it contains all of the drugs and amounts which he may officially prescribe for his panel patients. If he exceeds the amount indicated or if he prescribes a new and expensive drug he must explain his action to the Administrator. If the Administrator is not satisfied with the explanation—and often he is not—then he must explain it to the panel committee composed of laymen. If the committee is not satisfied, the physician must pay for the drugs himself. Disease does not stay in the book; but it is natural that most physicians should stay in the book if they wish to get along.

The second is that free choice of physician, though nominally allowed in many systems, means, only, that the patient may indicate his choice of names on the panel when he becomes insured. Under ordinary conditions his freedom of choice ends there and he must remain with the physician of his original selection.

Cost of Administration

Third: Insurance systems do not administer themselves. Even in England, known to have a fine concept of Civil Service, the cost of administering is 17 cents out of every sickness dollar. In all countries the cost runs from 17 to 20 per cent. Somebody must check the insurance rolls; somebody else must check the "book"; somebody else must check those who are reported sick to see if the sick man is really in bed and really needs the money. Somebody else must audit the accounts. Incidentally, this is how the sickness checkup sometimes works. Mr. B—has been sick with a bronchial ailment and is reported unable to work for another week. The checker goes to Mr. B—'s house, finds him working in his garden. The doctor says it's all right for Mr. B— to work in his garden; it's good for him; but Mr. B—is not yet well enough to go back to his work in one of the dusty trades. The Administrator fails to understand the distinction and the doctor dares not stand out against the Administrator. Mr. B— goes back to work.

One to Fifty

In all countries there is a least one employe to every 50 to 100 insured persons—in Wisconsin that would mean about 2,800 employes would be needed to administer a system for all employed persons.

Fourth: The Administrator inevitably becomes a trustee of funds and not, as one might expect, a guardian of the public health. He finds, at once, that every insured person wants "all that's coming to him"—and more. He knows, at the same time, that only about two per cent of the population is likely to be sick at any one time. On the one hand there is a heavy demand for care, some of it unnecessary—on the other is a fixed amount of money which must be made to cover all demands. His job becomes one of guarding his money, dogged always by the fear that it will not last the year.

It is noteworthy, at the same time, to contrast the headquarters of the sickness insurance administration in every country with most of the hospitals.

Ancient Hospitals

You see many hospitals where wonderful work is being done in spite of limited facilities in ancient buildings with old equipment. But the headquarters of the administrative system are new and modern in every respect.

At the Mercy of Parties

Fifth: The physicians are universally at the mercy of whatever political party may happen to be in power. In Vienna, I looked in vain for several noted physicians, most of them Aryans, famous physicians to whom I had been given letters of introduction. They had left Vienna; they would not be back. Why? Because they were not in sympathy with the Nazi party in power, and this was not exclusively a Nazi phenomenon. Nazi predecessors had banned other physicians before them. Sickness insurance systems cannot be separated from politics and government.

Sixth: Physicians are everywhere over-loaded. There is never time to give the individual patient all of the attention he needs.

"What Can You Learn?"

In an English teaching hospital where I spent several hours observing and asking questions, American-designed equipment and even American text books were being used. At the end of my visit, the chief of staff said to me: "And now may I be permitted to ask you a question? What is it that you, an American, can possibly learn from us?"

Medical care under European sickness insurance systems is a salvage service, only. There is neither time nor money for tracking down disease and opening up new fields.

Are we, then, to transfer these systems to America? Would they fit into our American scene?

Must Tell What It Means

That is for the people themselves to determine. The profession of medicine is only about 1000th of the population. Alone, you cannot hope to determine what the answer shall be.

Many proposals are being made today and the people know them by name, only. Their sponsors tell how the law might read. They do not tell what it means. The people must know what these proposals mean to them if they are to make a wise choice. You, the physicians, must tell them.

Doctors Were Leaving

Dr. Dyar: Some of the things we have done in South Dakota might be regarded as unorthodox; but we had a drought in South Dakota and we had to do unorthodox things to meet the conditions.

Many counties were so heavily in debt that they could not hope to handle their legal obligation to care for the sick. Many fine doctors were moving away because there were no patients left who could pay medical fees. Unless something could be done immediately, the majority of the people were going to be left without doctors or medical facilities.

Emergency Measures

Various emergency measures were tried in different localities. In one, funds were secured from the Children's Bureau to maintain a health unit, doctor, nurse and clerk, who provided medical care in the county. In another, aid was secured from the United States Public Health Service.

Farmers' Aid

The medical program of the Farm Security Administration began in May, 1937, with a Farmers' Aid Corporation organized to handle the funds turned over by the Administration for emergency medical care of its clients. At first, this service was available only to standard loan cases. Now, it is available to all who wish to join for $2 a month per farm family. Out of 40,000 farm family clients of the Farm Security Administration, 27,000 are members which means that about 135,000 are supplied with medical service.

The service is exclusively of an emergency nature. From November 1, when the service was re-organized, to the end of the government fiscal year, July 1, each family paid $16. One eighth of this amount was paid out each month for medical service. Any surplus above the need was pro-rated to participating doctors and dentists. The funds were paid out on the following scale: 51 per cent to physicians; 30 per cent to dentists; 15 per cent to hospitals; three per cent to pharmacists; one per cent to nurses (nursing care is not provided outside of the hospitals).

Difficulties

The administration of the service is complicated; we have had our difficulties.

First, with the doctors—A few of the doctors, knowing that they were going to get cash for their services, were not too particular to keep it to emergency care.

Unnecessary Services

Some rendered expensive and unnecessary service to cash in on the program. For instance, one sent a bill for six separate examinations and office calls (total $24), for treating six children in one farm home who had the itch.

Some, who operate small hospitals, unnecessarily hospitalized some cases, charging a hospital bill and $1 a call for each call.

Collecting Old Bills

Some used the program to collect old bills, moving the dates of old, unpaid-for services up to the date of the Farm Security program.

Occasionally, the doctor instructed the client to pay him direct, promising to reimburse the client if he collected from the Farm Aid Corporation.

Then there were difficulties with the clients—Some farmers attempted to cash in on the service immediately with new teeth and glasses neither of which were allowed. Some county commissioners, undoubtedly, promised farm clients any type of service including glasses, teeth and care for chronic ailments provided they joined.

Some clients refused to join until an acute illness arose and they needed expensive service.

Neurotic Shoppers

Some clients became neurotic medical shoppers, going from doctor to doctor just for the pleasure of having a physical examination.

The situation was made more difficult for the doctors and the Farmers' Aid Corporation by county commissioners who tried to lighten their load of indigent by sending relief cases to the Farmers' Aid Corporation.

Free Choice

Now, as to the good points of the program—There is no question but that some of our farm families are getting better care than they had before, especially in confinement cases.

The program is confined to the regularly licensed physicians.

Also the patient has free choice of physician.

Furthermore, many fine physicians have been enabled to remain in the state. If they had left, many less desirable practitioners, particularly foreigners who are constantly inquiring for opportunities, would have moved in.

Most of the doctors wish to continue the program even if they can collect only 50 per cent of their fees for the work they do.

For the future in South Dakota and anywhere else where such a program may be organized, I have these suggestions to make:

Suggestions

1. That all clients be given a physical examination before they are admitted to the service.
2. That the Farm Security Administration arrange for all clients to join so that costs can be spread.
3. That a limit be placed upon hospital days and medical service available through the program.

In theory, this is the best plan I have seen in operation anywhere for care of low income and border line farm families. Where doctors and clients are honest, it works.

MEDICAL POLICIES AND PROGRAMS

Programs and policies for 1939 of the various sub-committees of the Committee on Medical Economics were discussed by respective chairmen, at a meeting called January 4, by the general chairman, Dr. W. F. Braasch, Rochester.

As a result of this conference several changes in the general structure of the committee will be proposed to the Council at its next meeting. If the Council approves, another sub-committee devoted exclusively to the study of sickness insurance will be formed as part of the general committee. No such committee now exists in Minnesota and the need for it, as more and more plans are being formed and tried out elsewhere, is obvious.

Adding Industrial Health

Industrial health problems will be added, also, to the work of the Sub-committee on Industrial Relations, of which Dr. M. S. Henderson of Rochester is chairman. This committee has concerned itself, heretofore, with workman's compensation and relations with insurance companies. The new function is prompted by the increasing importance assumed by health problems of industry, recently signalized by a new committee on Industrial Health formed by the American Medical Association and also by the new program on industrial health which will be initiated by the State Department of Health in Minnesota if appropriations are made by the Legislature at this session.

To Avoid Overlapping

The usefulness of these occasional conferences of committee chairmen was clearly evident at the January meeting. All are dealing with matters of great moment to the medical profession in Minnesota; but their work must be evaluated periodically and brought into line with the working program of the association so that there will be no overlapping and so that no vital matters will be overlooked.

Talks to Small Groups

It was generally agreed that medical students are not sufficiently instructed in the vital details of their social and economic relations to fellow practitioners and to the public and that such instruction might well take the place of much of the detail work with which the curriculum is now crowded. It was suggested, however, that informal talks to fraternity and other small groups might be more effective than formal required lectures. Also, that the committee might function in assisting in the instruction of these speakers.

Promoting Interprofessional Relations

Chairman B. J. Branton, Willmar, of the Medical Advisory Sub-Committee, reported that there had been fewer malpractice cases, by half, during the past six months than in previous periods in Minnesota. This fine record is the result of three years of effort by the committee to promote a better sense of responsibility toward each other among the members of the association. Excellent relations with the bar association and with insurance companies were also reported by Doctor Branton. In this connection, a series of six interprofessional meetings throughout the state are being arranged by the committee in coöperation with the Interprofessional Relationships Committee, of which Dr. Savage of St. Paul is chairman. Lawyers, dentists, and physicians join in these meetings, the next one of which is scheduled for February 13 at the St. Paul Athletic Club.

For Farm Security Plan

The request made of the Council at its December meeting (see January issue Minnesota Medicine) for a medical service plan for Minnesota clients of the Farm Security Administration was at that time referred to the Sub-Committee on Low Income and Indigent Problems. Dr. W. A. Coventry, chairman, was not present at the conference but it was announced that a special meeting to study the proposal had already been called and that immediate consideration would be given to the matter.

It was the opinion of the chairmen present that the state association committee should not refuse to assist Farm Security Administration officials in the development of a plan in Minnesota since both Minnesota clients and their physicians would otherwise suffer. So far as the physician is concerned, in this case, the patient pays his own fees. The money is provided by loan from the Farm Security Administration.

Dissatisfaction

Doctor Henderson reported considerable dissatisfaction with the handling of industrial insurance cases because the choice of the patient is often ignored in the referral of industrial cases.

Dr. J. M. Hayes, Minneapolis, outlined the "gentleman's agreement" arrived at earlier with the Industrial Commission by which choice of the patient was to be recognized and fees paid.

It was suggested that another meeting be held with the commission soon to clarify the entire matter; also that a representative of the Minnesota Federation of Labor be present to convey to the commissioners Labor's declared preference for choice of physician in industrial medical practice.

Dr. George Earl, Saint Paul, President of the Minnesota State Medical Association, outlined the Association's 1939 "Co-ordinated Medical and Public Health Program" which begain with the January program of education on pneumonia prevention and control.

Real Problem

According to Doctor Earl, medical association representatives should establish it definitely that physicians are primarily interested in the health of the people. They recognize, of course, that medical costs have increased and they are carefully studying all proposals to ease economic burdens of sickness. In Minnesota, at least, medical care is better than average and above the level of other essentials, such as food and housing. The real problem lies with the man with the $100 a month income who feels that government care is the answer to his problems. For him, group hospital insurance can bring a major assistance in payment of costs of illness and, perhaps, no further experiments in sickness insurance should be tried while group hospital insurance is being developed and extended in Minnesota.

For Training Speakers

The Forum on Medical Care scheduled for January 14 in St. Paul was designed to assist in the training of all physicians in the intelligent discussion of the social and economic problems of medicine, with friends or patients and before the public. The question remains, Doctor Earl said in conclusion, how much shall these matters be stressed in public.

Dr. F. A. Olson of Minneapolis, chairman of the Sub-committee on Contract Practice, recalled that the American Medical Association was at one time opposed to helter-skelter discussion on the subject.

Dr. Buie was of the opinion that speakers should not be left to volunteers.

Must Be Prepared

"We are being called upon to speak," Doctor Braasch said, "and we must be prepared to respond. That means that we must be thoroughly well informed, that we must understand the lay point of view and be sympathetic toward it while we undertake to explain fully the issues involved.

"The Co-ordinated Medical and Health Program instituted for 1939 by the state association is a step in advance in our public relations and an excellent approach to education concerning the philosophy and standards of our American system of care."

COUNTY OFFICERS TO MEET

Important speakers and timely discussions will mark the 1939 program of the annual County Officers' Conference scheduled for Saturday, February 25, at the Saint Paul Hotel.

Round table breakfast discussions will begin at 8 a. m., and continue until 10. The Medical Survey, medical relief service under the "choice of vendor" legislation, group hospital insurance, medical care for Farm Security clients and membership will be discussed at this informal session.

A symposium on methods of public education will follow with outside experts in platform speaking, radio and newspapers as speakers.

Industrial hygiene and workmen's compensation will be the subject for a second symposium which rounds out the morning program. On this section of the program representatives of Labor, of the Industrial Commission and the insurance companies will talk; also the new program for industrial health contemplated by the State Department of Health will be outlined.

For the afternoon, the general subjects will be national and state legislation on health and medical problems. For these discussions, Dr. R. G. Leland, director of the Bureau of Medical Economics of the American Medical Association, will be present and representatives of both the House and Senate of the state legislature will talk.

The meeting comes at a time when the air is full of plans, rumors, public and private discussions on medical care. It provides a unique opportunity for discussion and exchange of information. Travelling expenses of one representative from each society will be paid as usual by the association. Every member is invited to attend, however, and all will be guests at luncheon.

AS ONE READS, SO ONE THINKS

(Monthly editorial prepared by the Medical Advisory Committee.)

Headlines in papers, sketches in magazines, editorial writers, and radio commentators depict the changing world. As the world thought and map changes, so medicine is an ever changing science. The books and procedures of ten years ago become obsolete in the new light of today. Progress cannot be stopped, and he who wishes to turn back the pages to yesterday finds himself lost in a maze.

But, fundamentally, the ideals of the medical profession are the same. Unselfish service to others has become a part of the life and being of the medical man. Monetary gain has been a secondary consideration; the wealthy physician is a rarity. Success in our work is not measured by material wealth but by the regard in which we are held by our clientele. This success depends, of course, to a great extent on natural ability; but, added to natural ability must be industry, integrity, and a clear, professional understanding of the problem at hand. The physician-patient relationship is a sacred thing which no amount of legislation can take away.

Your Medical Advisory Committee does believe, however, that the physician-physician relationship can be improved by closer and clearer understanding of the other physician's problems and less criticism of his work.

Study in post-graduate centers, fraternizing with those from a distance and attendance at society meetings of our own soon scatter the cobwebs in destructive thinking. Participation in programs and the writing of papers maintain up-to-dateness and equilibrium of ideas.

But, withal, one should not forget that we are citizens with specialized training entitled to the same protection afforded other citizens under the law and, as such, we have a clear right to the fruits of our labor in proportion to the time spent in preparation and the ability gained by the successful use of this preparation in the service of suffering humanity.

Happy is he who each day spins one more thread into the pattern of a successful life.

—B.J.B.

THE DOCTOR'S BILL

(Paragraphs from an important leading editorial which appeared in a recent issue of the *Chicago Tribune.*)

The indictment of the American Medical Association and some of its directing officials was not a courageous act in the sense that the Administration is likely to lose great numbers of votes as a result of its action. The probabilities, fortunately, are all the other way. . . .

When everybody else sends flowers, the doctor sends a bill. All too frequently it arrives when the family is hard-pressed because of loss of income resulting from the illness itself and because drugs, nursing, hospital care and special diets have imposed unexpected burdens upon the family budget. . . . Illness itself inspires in the victim and his family a sense of injustice. . . .

Accordingly, many citizens would welcome state or socialized medicine.

The medical association has resisted that trend with all the vigor at its command, believing that if doctors had to look to the government for support, the quality of medical service and the competence of the profession would decline rapidly.

The present administration in Washington is eager for new fields of activity to dominate. . . .

Whatever the faults of the present organization of medicine, the fact is that disease and death rates have dropped to the lowest point in the history of the country. Medical science has made phenomenal progress, thanks in no small part to the activity of the medical association. . . . Families of moderate means constitute the largest single element in the population. If their needs were not being met pretty satisfactorily now the death and disease rates would be rising, not falling.

The doctors have recently proposed a plan which deserves sympathetic study. They suggest that the risk of illness among persons of small income be covered by insurance with an annual premium which would not place an undue strain on the ordinary family's budget and which would cover ordinary risks. . . .

In spite of the fact that its material rewards are not great, medicine, today, attracts and holds superior young men and women; it would not do so if they felt that their future depended on governmental favor rather than personal attainments. Experience teaches that there is far more reason to place confidence in the high purpose and altruism of the doctors than in the tall talk of politicians or the wishful thinking of professional reformers.

NORTHWEST CONFERENCE

The annual Northwest Regional Conference takes on an especial importance this year as Congress awaits introduction of legislation embodying the National Health Program and as several state and county societies prepare to embark upon new experiments in prepayment plans for care of the sick.

The date selected is Sunday, February 12, one day in advance of the Annual Congress on Medical Education and Licensure. The place is the Palmer House, Chicago. The Missouri State Medical Association, of which Dr. Carl F. Vohs of St. Louis is president, is host society for the meeting.

Among program features of great interest will be reports on the new medical programs in Michigan and in California; a review of the legislative situation in Washington by Dr. R. G. Leland, director of the Bureau of Medican Economics of the American Medical Association, and a review of the progress to date of the Survey of Medical Needs and Supply, conducted all over the United States under the auspices of the American Medical Association, by Dr. W. F. Braasch of Rochester, chairman of the National Advisory Committee on the Survey.

All medical society officers and interested members are urged to attend this meeting.

Minnesota physicians will recall that the Northwest Regional Conference originated in Minnesota and was held for many years in Saint Paul, with the Minnesota State Medical Association as host. Removal to Chicago was occasioned by the participation of distant East Central states in the deliberations.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Windom Osteopath Fined $250.00 for Practicing Medicine Without License

Re: State of Minnesota vs. John L. Moore.

On December 22, 1938, John L. Moore, a licensed osteopath with offices at Windom, Minnesota, entered a plea of guilty to an information charging him with the crime of practicing medicine without a license. The Honorable Charles A. Flinn, Judge of the District Court at Windom, sentenced Moore to pay a fine of $250.00 and court costs of $7.00. Moore paid the fine and costs in preference to serving a jail sentence.

The complaint against Moore was filed by Mr. Brist on behalf of the State Board of Medical Examiners following an investigation which disclosed that Moore was prescribing and furnishing medicine for the internal use of patients. In the instant case Moore had furnished and administered an alleged cough medicine for a 2-year-old girl. The little girl suffered a burn on the side of her face when some of the medicine came in contact with her face following her refusal to take the medicine. The parents attribute the burn to the cough medicine. Moore then prescribed some medicine for the burn.

The Medical Board's investigation disclosed that Moore was writing prescriptions that were being filled at one of the local drug stores for medicines of various kinds, all of which were to be taken internally. The records of the Medical Board show that Moore was warned as far back as 1930 to confine his practice to osteopathy, for which he holds a license.

OF GENERAL INTEREST

Dr. John R. Black of Rochester was recently married to Miss Betty V. Hume of Anadarko, Oklahoma.

* * *

Dr. William L. Mackenzie King of Rochester was married recently to Miss Marjorie Rean of Toronto, Canada.

* * *

Dr. M. M. Hursh, formerly of Grand Rapids and Cohasset, has opened offices in Hibbing for the practice of medicine.

* * *

Pharmacists are forbidden by law to refill narcotic prescriptions. Complaints have reached the Minnesota State Medical Association through the Minnesota State Pharmaceutical Association that some physicians are forgetful of this provision of the Minnesota Narcotics Law. Physicians must not expect druggists to refill prescriptions containing narcotics.

Dr. H. S. Sherman, formerly of Plainview, has moved to Spring Valley, where he has opened offices for the practice of medicine.

* * *

Dr. L. E. Prickman of Rochester was inducted into office as president of the local Kiwanis Club for 1939, at a meeting held on December 29.

* * *

Dr. P. F. Sorum, formerly of Lumberport, West Virginia, has located in Jasper for the practice of medicine. Dr. Sorum is a graduate of the Rush Medical College in Chicago.

* * *

Dr. Richard A. Bardon of Duluth has been named chief of staff of the Miller Memorial Hospital for the current year. Dr. Philip Eckman is vice chief-of-staff, and Dr. Harold Hoff, secretary-treasurer.

* * *

Because agranulocytosis has been found to follow prolonged administration of amidopyrine containing drugs, the content of this drug in allonal has been replaced by three grains of acetophenetidin to the tablet.

* * *

Dr. M. G. Gillespie of Duluth was elected chief of staff of St. Mary's Hospital at its annual meeting recently. The principal speaker at the meeting was Dr. M. B. Visscher of the University of Minnesota department of physiology, who spoke on "The Growing Importance of Physiology to the Practice of Medicine."

Dr. A. H. Field has recently become a member of the state hospital medical staff, Fergus Falls. A graduate of Marquette university medical school, Dr. Field interned at St. Joseph's hospital in Saint Paul and at Fairview hospital in Minneapolis. Dr. Albert A. Bodaski of Minneapolis has also joined the staff.

* * *

Dr. A. M. Watson, who has been practicing in Royalton for thirty-four years, has taken his son, Dr. Sidney W. Watson, of Alexis, Ill., into partnership. Dr. Sidney Watson is a graduate of the Minnesota University medical school. He sold his practice at Alexis last fall where he had been located for more than four years.

* * *

A symposium on the "Public Health Significance of the Virus and Rickettsial Diseases" will be presented by the faculty of the Harvard School of Public Health June 12-17, 1939. Lectures will occupy five mornings and clinics and demonstrations will be given each afternoon. A fee of $25.00 will be charged. Further information may be obtained by writing the Secretary of the School of Public Health, 55 Shattuck Street, Boston.

* * *

The American Board of Obstetrics and Gynecology announces that the general oral, clinical and pathologic examinations for all candidates, Part II Examinations (Group A and B), will be conducted by the entire Board, meeting in St. Louis, Missouri, on May 15 and 16, 1939, immediately prior to the annual meeting of the American Medical Association.

Application blanks and booklets of information may be obtained from Dr. Paul Titus, Secretary, 1015 Highland Building, Pittsburgh (6), Pennsylvania.

* * *

The Council on Physical Therapy of the American Medical Association has a number of films illustrating the value of physical therapy methods which can be borrowed for educational use by medical societies. These films illustrate certain methods used in muscle training, occupational therapy, underwater exercises, massage, and present the effects on circulation of heat and cold and massage.

In addition, films on the subject of syphilis, cancer, blood transfusion, the physiology of labor, pneumonia, and the treatment of burns, are obtainable.

These films may be obtained by writing to the Director of Exhibits of the American Medical Association, the only cost entailed being the cost of transportation.

* * *

The American Board of Ophthalmology announces an important change in its method of examination of candidates for the Board's certificate.

Examinations will be divided into two parts. Candidates whose applications are accepted will be required to pass a *written* examination which will be held simultaneously in various cities throughout the country approximately 60 days prior to the date of the oral examination.

The *written* examination will include all of the subjects previously covered by the practical and oral examinations.

Oral examinations will be held at the time and place of the meeting of the American Medical Association and of the American Academy of Ophthalmology and Oto-Laryngology, and occasionally in connection with other important medical meetings. The *oral* examination will be on the following subjects: External Diseases, Ophthalmoscopy, Pathology, Refraction, Ocular Motility, Practical Surgery.

Only those candidates who pass the written examination and who have presented satisfactory case reports will be permitted to appear for the oral examination.

Examinations scheduled for 1939: *written*: March 15 and August 5. *Oral*: St. Louis, May 15; Chicago, October 6.

Applications for permission to take the written examination March 15 must be filed with the Secretary not later than February 15.

Application forms and detailed information should be secured at once from Dr. John Green, Secretary, 6830 Waterman Ave., St. Louis, Mo.

* * *

U. S. Navy Medical Corps

The Medical Corps of the United States Navy offers a number of internships and commissions to graduates of Class "A" medical schools who have completed or are about to complete an internship in a civilian hospital. Examinations will begin on Many 8, 1939, and applications should be on file at least one month prior to that date.

Qualified candidates who have completed internships in civilian hospitals and who successfully pass the competitive examination will be commissioned as Assistant Surgeons with the rank of Lieutenant (junior grade) and assigned to the Naval Medical School, Washington, D. C., for a postgraduate course of instruction prior to their assignment to sea or foreign shore duty.

Candidates must be United States citizens between the ages of 21 and 32 years at the time of appointment, and pass a physical and professional examination.

Officers of the rank of Lieutenant (junior grade) without dependents receive compensation of $2,699 per year, while those with dependents receive $3,158 per year. There are additional cash allowances.

If interested, write at once for further particulars to Bureau of Medicine and Surgery, Navy Department, Washington, D. C.

◆ REPORTS and ANNOUNCEMENTS ◆

MEDICAL BROADCAST FOR FEBRUARY

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association Broadcasts weekly at 11:00 o'clock every Saturday morning over Station WCCO, Minneapolis (810 kilocycles or 370.2 meters) and Station WLB, University of Minnesota (760 kilocycles or 395 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota. The program for the month will be as follows:

February 4—Communicable Disease
February 11—Obedience in the Home
February 18—Physical Defects in Childhood
February 25—Children's Dentistry.

STATE MEETING

The program of the Minnesota State Medical Association's 86th annual meeting is now complete, according to a report just issued by the Committee on Scientific Assembly.

The meeting will be held May 31, June 1 and 2, at the Minneapolis Auditorium with business sessions of the Council and House of Delegates scheduled on the evening of May 30 in advance of the meeting.

Internal medicine, surgery, obstetrics and gynecology, urology, dermatology and radiology will be represented on the scientific program with eight distinguished out-of-state speakers, as well as members of the association, to address the sessions. Scientific sessions will be confined, for the first time, to two days of program time, Friday, June 2, being devoted exclusively to the second Congress of Allied Professions dealing with public health and the public relations of medicine.

Round table luncheons will be a feature of the scientific sessions on Wednesday and Thursday, May 31 and June 1. A series of ten or more luncheons is being planned, each on a separate subject. Attendance at these luncheons will be limited to twenty each in order to facilitate informal discussion.

The annual banquet, scheduled for Thursday night, and also hotel headquarters for the meeting will be at the Curtis hotel.

Physicians from all of the nearby states will be invited to attend the meeting, which constitutes the only major medical gathering in the Northwest this year. Dentists, hospital administrators, nurses, technicians, welfare workers and all others who are in any way concerned with the delivery of medical services will be invited to the congress on Friday.

Members of the committee in charge of the program are: Dr. B. B. Souster, and Dr. Allen Wilson, Saint Paul; Dr. V. S. Counsellor, Rochester; Dr. F. H. Magney, Duluth; Dr. Charles Bolsta, Ortonville; Dr. B. O. Mork, Jr., Worthington; Dr. J. A. Myers, Minneapolis; Dr. W. A. O'Brien, University of Minnesota, Dr. George Earl, Saint Paul; Dr. J. M. Hayes, Minneapolis, and Mr. R. R. Rosell, Saint Paul. Dr. A. E. Cardle, Minneapolis, is chairman of the Committee on Local Arrangements.

AMERICAN CONGRESS IN OBSTETRICS AND GYNECOLOGY

The first Congress of Obstetrics and Gynecology will meet in Cleveland, Ohio, September 11-15, 1939, and will be sponsored by the American Committee on Maternal Welfare, Inc., of which Dr. Fred Adair is chairman.

Sessions will occupy mornings, afternoons, and evenings of the five days of the Congress and various phases of the subject of human reproduction will be handled. This will include medical care from the standpoint of the general practitioner, specialist and educator, obstetric nursing, obstetrics from the standpoint of public health and the institutional administrator.

Those wishing to attend should communicate with the American Congress of Obstetrics and Gynecology Headquarters, The Annex, 650 Rush Street, Chicago, Illinois.

BLUE EARTH COUNTY SOCIETY

Dr. G. A. Liedloff of Mankato was elected president of the Blue Earth County Medical Society for 1939, at the annual meeting of the Society held late in December at the Mankato Clinic. Dr. R. K. Edwards of Elysian was elected vice president, and Dr. C. A. Koenigsberger of Mankato was elected secretary.

WASHINGTON COUNTY

At the January meeting of the Washington County Medical Society, Dr. D. Greth Gardiner of Saint Paul presented a very interesting lecture on bronchoscopy. The lecture was illustrated by x-ray plates on which the pathologic changes were clearly indicated and explained by Dr. Gardiner. After this lecture the Society indulged in comments on welfare work and the compulsory insurance which the federal government is trying to force upon us. Hospital insurance, both commercial and non-profit in character, came up for consideration, as did also the meeting at the Saint Paul Hotel on January 14.

WINONA COUNTY SOCIETY

The annual dinner and meeting of the Winona County Medical Society was held on Monday evening, January 9, at the Hotel Winona.

About forty persons attended the dinner, which was followed by a talk by Dr. Lewis G. Jacobs, roentgenologist at the Winona General Hospital, on "Therapy of Cancer of the Breast," and a talk by Dr. John Tweedy of Winona on "Chronic Abdomen and Its Relation to the Abdominal Triad."

Dr. R. L. Page of St. Charles was elected president; Dr. William Von Rohr Heise of Winona was elected vice president, and Dr. H. J. Roemer of Winona was elected treasurer. Dr. I. W. Steiner of Winona was re-elected secretary.

Members of the Auxiliary were entertained at dinner at the hotel, by the Society. Following the dinner, a meeting was held at the home of Mrs. Robert Tweedy. About fifteen members were present.

* * *

ST. JOSEPH CLINICAL SOCIETY

The St. Joseph Clinical Society, St. Joseph, Missouri, will hold its eighth annual spring clinic on March 28 and 29, at the Hotel Robideaux, St. Joseph, Mo. There will be no registration fee. The purpose of the meeting is to offer a concentrated post-graduate course in recent advances in clinical medicine and surgery as interpreted by eminent clinicians who will be guest speakers. Over sixty such guest speakers have already honored the society in the past. This year's speakers offer an especially attractive series of clinical lectures.

Aware of the ever increasing importance of more recent social trends as they affect organized medicine, the committee has secured Dr. Morris Fishbein, who will deliver an address to which the general public will be invited. Two luncheons and banquets will be reserved for relaxation and entertainment.

Among those taking part in the program are the following:

Dr. Gershom J. Thompson: "Transurethral Prostatic Resection."
Dr. Q. U. Newell: "Cancer of the Uterus."
Dr. Fred J. Taussig: (Round Table Discussion) "Treatment of Septic Abortion."
Dr. F. J. Taussig: "The Coördination of Radium with Surgery in the Treatment of Cervix Cancer."
Dr. Willis C. Campbell: "Some Aspects of Surgery of the Hip Joint."
Dr. Heyworth N. Sanford: "Jaundice in the New Born."
Dr. Heyworth N. Sanford: (Banquet) "Some Observations on Disturbances of Blood Coagulation."
Dr. August A. Werner: "The Effect of the Ductless Glands in Growth and Development."
Dr. Ralph A. Kinsella: "The Pneumonias."
Dr. Walter C. Alvarez: "Useful Hints in the Treatment of Indigestion."
Dr. Maurice C. Howard: "Problems of Gastric Hemorrhage."
Dr. Morris Fishbein: (Noon Luncheon) "American Medicine and the National Health Program."
Dr. Morris Fishbein: (Open Public Address) "The Social Aspects of Medical Care."
Dr. J. A. Myers: "Modern Methods in Diagnosis and Therapy of Tuberculosis."
Dr. Coyne H. Campbell: "Practical Points in the Management of Neurotic Symptoms, Inhibitions and Anxiety."
Dr. Manuel Grodinsky: "Pyogenic Infections of the Hand and Foot."

The St. Joseph Clinical Society extends a cordial invitation to all members of the medical profession who may wish to be guests at this clinical gathering.

WOMAN'S AUXILIARY

Mrs. W. B. Roberts, Minneapolis, *President*
Mrs. E. V. Goltz, 2259 Summit Avenue, Saint Paul, *Publicity Chairman*

The Women's Auxiliary of the Olmsted-Houston-Fillmore-Dodge County Medical Society met at 8 P. M. January 4, at the Mayo Foundation House, Rochester. Edward H. Weld, Jr., described health insurance plans being tried in various localities. About twenty-five members were present. Following the talk by Mr. Weld, Mrs. H. C. Habein, president, showed colored motion pictures of England which she had taken on her recent trip abroad. Refreshments and a social hour followed.

* * *

Mrs. M. L. Hershfield of Duluth, state parliamentarian, was a guest of Mrs. Wm. B. Roberts, state president, in Minneapolis, January 6 and 7.

* * *

Mrs. A. A. Passer, member of the Advisory Committee, was a guest in the Twin Cities, January 9 and 10.

* * *

The second State board meeting will be held in Saint Paul, Wednesday, February 1. Mrs. E. M. Hammes of Saint Paul is the social chairman for the event and Dr. George A. Earl will address the group. Mr. F. M. Brist will be the guest speaker.

* * *

The Women's Auxiliary of the Ramsey County Medical Society announce that they cleared $1,500 from the play "The Dream of a Clown" which they sponsored December 16 and 17, in the Saint Paul Auditorium. Much credit is due those members who contributed their energy and time for the success of this undertaking.

The Ramsey County Auxiliary will present cups to the two winners of essays which were chosen during the recent tuberculosis campaign at the regular meeting of the group, January 23. The winners who will read their essays for the organization are Eileen O'Keefe, a pupil of the Visitation Convent, and Clinton Marshall, a pupil of John Marshall High School. The title of the essays is "Tracking Down the Foe of Youth—Tuberculosis."

The Red Cross Society has announced that the Ramsey County Medical Auxiliary led all other organizations in the selling of Red Cross subscriptions—based on the percentage of the amount over the quota given to sell. Mrs. J. A. Moga, assisted by her committee, made 133 per cent over their quota in the booths in the Lowry Medical Arts Building.

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of November 9, 1938

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, November 9, 1938. Dinner was served at 7 o'clock and the meeting was called to order at 8:10 p. m., by the President, Dr. R. T. La Vake.

There were sixty members and one guest present. Minutes of the October meeting were read and approved.

The proposed amendment to Article III, Section 1, of the Constitution, making possible an increase in University Membership from five to ten members, was voted on and carried.

The scientific program consisted of five case reports as follows:

ACUTE FATAL CORONARY THROMBOSIS WITH GALLBLADDER SYMPTOMS

Report of Case

Charles N. Hensel, M.D.
Saint Paul

Mrs. C. R. C., aged fifty-five; former occupation, nurse; married eight years; childless; entered Miller Hospital, Saint Paul, February 10, 1938, and died on February 22, 1938.

On entering the hospital her chief complaints were heartburn, intense pain in upper right quadrant, nausea and vomiting.

She had had polyarthritis at the age of thirty-four followed by mitral valvulitis and stenosis, with recovery. She was a nurse in the Veterans' Bureau from 1921 to 1930. Appendectomy in 1924. No history of gallbladder disease. She was in Miller hospital in 1932 for three months with congestive heart failure following coronary occlusion, making a good recovery. Blood pressure varied from 170/100 to 135/85. Radiograph of the heart at that time showed a universal enlargement, particularly to the right, prominence of pulmonary conus, bulging of left auricle into the mediastinum as disclosed by barium meal in gullet. Total transverse diameter was 15.2 cm.—52 per cent of chest diameter. The patient was fairly active after leaving the hospital, with occasional attacks of auricular fibrillation and mild congestive heart failure relieved by bed rest and cardiac tonics.

History preceding present recent admission to the hospital: On January 28, 1938, she was seen at the office because she was greatly agitated over the recent death of two dear friends and the possibility that she might be involved in litigation of the will of one of them in which she was a beneficiary. Blood pressure at that time was 184/90, heart rate 72, rhythm regular, presystolic murmur at apex and a snapping pulmonic second.

On February 7, 1938, she was seen at home complaining of intense heartburn for the past seven days. This was described as a pressure pain or a burning sensation at the tip of the sternum at the right costosternal margin. The heart showed no changes in rate, force or rhythm. Blood pressure, 156/98. Lungs clear. Abdomen soft and pliable. No tenderness in the region of the gallbladder. Temperature was normal. Her condition was considered not serious. Antacids and antispasmodics were prescribed. Two days later (February 9) the patient 'phoned that she felt relieved and would go through with a dinner party that evening as planned.

The following day (February 10) she was seen at home propped up in bed, rocking back and forth in great distress, still complaining of burning pain at the tip of the sternum and along the right costal margin. She had vomited all night long. On examination, the lungs were negative, heart showed no abnormalities in rate, force or rhythm. The gallbladder region gave some tenderness and some muscle spasm on examination. She was sent into the hospital for studies of the gallbladder. The heart was not considered to be the source of symptoms.

Radiographs of the gallbladder showed a large, flaccid gallbladder, tortuous in outline, good density but sluggish in emptying; no stone shadows. Sedimentation rate—1 hour, 52. Urine showed a trace of albumin and no sugar. Hb. 76 per cent, r.b.c. 4,220,000, w.b.c. 12,100.

On February 12, Dr. Zimmermann saw the patient in consultation—the condition not considered surgical, might be due to heart. The patient was fibrillating at the time of examination. She was still complaining of epigastric pain, nervous and very emotional.

On February 14, her condition became critical, pulse imperceptible, blood pressure 82/64, electrocardiograph, auricular flutter 2-1. In an oxygen tent there was sudden collapse, convulsive movements, and the patient became unconscious. Death was imminent. The patient became cold all over, occasional gasping, heart tones feeble, rhythm regular, rate 100. After about three-quarters of an hour in this condition the patient began to breathe normally, opened her eyes, and remarked, "I think that I have died; I cannot see; I cannot move my arm." She had a flaccid paralysis of the right arm and was blind although examination of the eye grounds was impossible due to contraction of the pupils.

From February 15 to February 22, 1938, the patient was unable to retain nourishment by mouth, in a state of marked mental agony asking to die, asking for relief, asking for opiates (which were given freely without calming effect). The patient thrashed and threw herself about, became increasingly dyspneic and cyanotic, heart rate rapid, rhythm irregular, tones feeble, pulse barely perceptible. Blood pressure 76/60. First elevation of temperature on February 16 at 99°, rose to 101° at death. Leukocytes 24,000 to 34,000. As her heart failed, the urine showed increasing amounts of albumin and hyalin and granular casts. On February 17 the blood sugar was 111 mgm. Coma developed on February 20. The patient expired on February 22 and an autopsy was obtained.

Autopsy.—Chief findings in heart: Weight 450 grams. The epicardium is rough and covered with flakes of fibrin. The pericardial sac contains about 15 c.c. of thick, purulent fluid. The myocardium is dark red in color, fairly firm in consistency. The left ventricle is 1.5 cm. thick. Along the course of the anterior descending branch of the left coronary are seen numerous white patches of fibrosis in the heart muscle. Along the posterior branch of the left coronary are seen grayish green areas of infarction extending into the interventricular septum. The endocardium is smooth and free from thrombi. The mitral valve is thickened and fibrous. A fairly firm vegetation about 5 mm. in diameter is found at the periphery of the valve. The remaining valves are normal. The root of the aorta shows a smooth intima. The coronary arteries are markedly sclerotic throughout. The lumen of the left coronary is considerably narrowed. Two centimeters from the orifice of the left coronary artery the lumen is practically occluded by a thickening of the wall and a fairly soft coagulum which was probably terminal.

Findings in the gallbladder were normal.

Comment.—This is a case of diffuse coronary sclerosis with an area of fibrosis from a healed infarct (1932). Progressive occlusion of the smaller branches of the posterior portion of the left coronary artery resulting in a patchy infarction, all recent, *i.e.,* from a few days to within three weeks, undoubtedly accounting for the burning pain in the epigastrium. Examination of the head was not permitted, but the finding of a fresh vegetation in the mitral valve explains the convulsive attack, blindness, paralysis of the right arm occurring a week before death.

LACERATIONS OF LARGE AND SMALL INTESTINE WITHOUT PERFORATION

Report of Case

A. W. Ide, M.D.

Saint Paul

This patient is a young man, eighteen years old. He was employed as a machinist apprentice in a railroad shop and was injured October 8, 1938, at 9 o'clock in the morning.

In the shops, where he was working, a locomotive drive wheel was being moved by means of a power hoist. This wheel was resting on the floor of the shops but held in a nearly upright position by means of chains attached to this hoist. The wheel was not directly upright but was leaning slightly to one side. In the course of the work, the position of the wheel was changed and it was tipped toward the other side. As the wheel tipped, it struck this patient in the lower abdomen. The wheel had nearly reached its permanent position before the blow was struck so that the blow was not apparently very severe. It was, however, sufficient to immediately cause the patient very severe pain in the lower abdomen. He was immediately brought to the hospital in an ambulance.

On examination, the patient appeared to be a normal young man in very acute pain. The abdominal muscles were relaxed except on the left side, where there was a moderate degree of rigidity. There was great pain in the lower abdomen on the left side and near the iliac crest. The patient's general appearance and complaint gave one the impression that he had sustained a severe bone injury in this region. There was some vomiting. He was given a hypodermic injection of a quarter grain of morphin sulphate on admission and another sixth of a grain of the same drug two hours later. The morphin relieved the pain somewhat but the patient did not sleep. He still complained bitterly of pain and localized this pain in the region of the lower abdomen.

A catheterized specimen of urine showed no blood or other abnormality. A blood examination showed 85 per cent hemoglobin, with 4,270,000 red blood cells and 8,900 white blood cells. The temperature was normal. The pulse rate on admission was 86.

About three hours after the injury he began to develop rigidity of the abdominal muscles and at 3 p. m., six hours after the injury, the abdomen was boardlike. A diagnosis of perforation of the bowel was made and operation was advised.

A left rectus incision was made. There had been some bleeding in the abdominal cavity but it was not at all extensive. Lacerations of the bowel were found as illustrated (Fig. 1). There was one laceration in the lower sigmoid, 3 inches in length and 1.5 inches in width. The outer coats of the bowel were torn but the mucous membrane was still intact. There was another laceration just below the splenic flexure. This was 2 inches in length and 1 inch in width. There was another laceration about midway in the transverse colon and there was a similar laceration of the small bowel. The lacerations were repaired. There was no sign of bowel content in the peritoneal cavity and no actual perforation could be found in the regions of laceration. General exploration of the abdominal cavity was made but no further injury could be found.

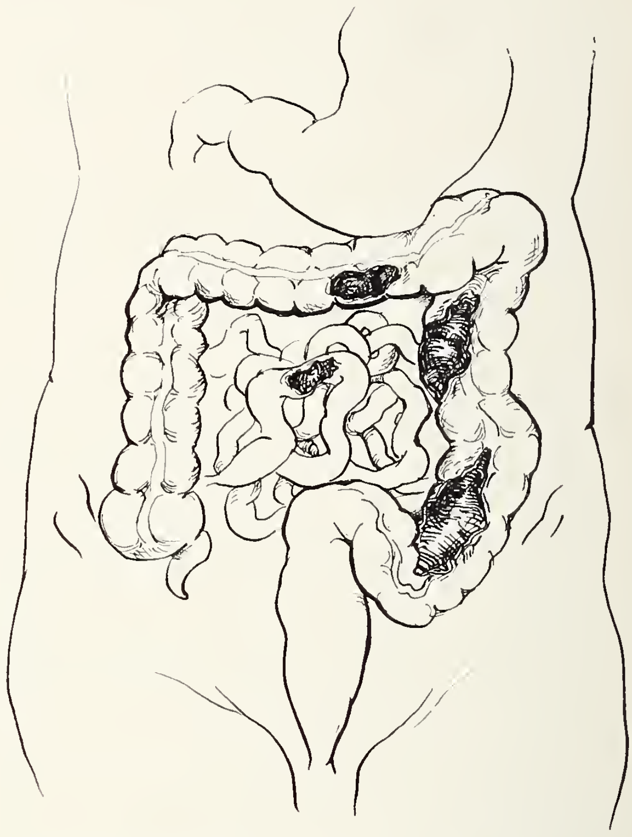


Fig. 1. Lacerations of the large and small intestines without perforation.

The abdomen was closed without drainage and the patient has made an uninterrupted recovery.

Comment.—This case was interesting to us primarily because of the fact that the patient developed signs of perforation of the bowel when no actual perforation was present. The lesions consisted of multiple lacerations of the bowel without perforation. There were no injuries to the other abdominal organs and there were no injuries to any bones.

CONGENITAL UNILATERAL RENAL AGENESIA

Report of Case

Martin Nordland, M.D.
Minneapolis

The case is that of a female patient, sixty-four years of age, married, who, on December 2, 1937, was taken ill with a pain in the upper abdomen. She stated that it came on shortly after she ate her Sunday dinner. The pain lasted during that day and the following night but was not sufficient to keep her awake. She was not nauseated. She had two stools before retiring, which was unusual. For the next two days she was fairly well relieved with a hot water bottle. Although she was not very ill, she called a physician on the third day because the pain, which had localized in the right lower abdominal quadrant, had not entirely subsided. She entered the hospital with a diagnosis of appendicitis.

On admission her temperature was normal, pulse was 90, and hemoglobin 93 and 95 per cent, N & D. The leukocyte count was 49,900, which was checked. Red cells numbered 5,060,000. The differential whites were: small lymphocytes, 5.5; large monocytes, 11.5; and polymorphonuclears 80 per cent.

The urine was reported to have an orange color, cloudy appearance, acid reaction and specific gravity 1.033. There was a large trace of albumin and no sugar. There were no casts and the microscopic field was obscured by bacteria. On the following day the color of the urine changed to straw, it was clear, still had a large trace of albumin, no casts and the microscopic examination showed 6 to 10 pus cells per high-power field and 1 to 4 red blood cells. The third specimen, on the succeeding day, showed urine straw colored and clear, still a large trace of albumin, no casts and 100 to 150 pus cells per high-power field and 60 to 80 blood cells.

The leukocyte count in the three days after admission dropped from 49,900 to 40,000, 28,000 and 18,400.

The patient was a rather slender individual, moderately well nourished, and during the four days following her admission the physical examination was essentially negative except for the presence of a firm mass which seemed to fill the right abdomen down to the level of the right anterior superior spine. There was no rigidity but there was a slight spasticity of the right rectus muscle. The mass seemed a little irregular and was only a little tender. There was considerable pain over the right kidney region, posteriorly. On account of the "orange" color of the first specimen of urine examined, the urinalysis referred to above and the high leukocyte count, together with the pain in the region of the right kidney, a tentative diagnosis of surgical lesion of this kidney was made.

Plates were made of the urinary tract and the roentgenologist's report was as follows:

> "These show the outline of the left kidney clear. This is not enlarged. The outline of the right kidney and *right psoas shadow is obscured.* There is no evidence of urinary stone. Plates made after the injection of diodrast show the pelvis and calyces of the left kidney and left ureter to be well outlined. There is no excretion of the dye from the right side.
>
> "Conclusions: The right kidney outline is not visualized. The *right psoas muscle is not visualized.*
>
> "Following the dye, we can demonstrate the kidney and ureter on the left side. No conclusions can be drawn from the right side except that the right kidney is not functioning at this time."

Two days later a cystoscope was introduced and exploration of the bladder revealed the absence of a right ureteral orifice. The left ureteral orifice was observed, slightly prolapsed. The bladder was otherwise normal. Spurts of clear urine came at regular intervals, about every five seconds, from the left ureteral orifice. Indigo carmine was introduced intravenously. Function was normal on the left but nothing appeared on the right and further search revealed complete absence of the right orifice.

Ten days after admission, the patient was comfortable, without temperature, leukocyte count 14,500 and the urine, which was clear and straw colored, showed only a trace of albumin with only 5 to 10 pus cells and no red blood cells per high-power field. The mass described was still present.

Preoperatively, it was felt that the mass could be reached best through the abdomen anteriorly, but, because of the possible presence of pus, we felt that it was best to approach it through an extraperitoneal kidney incision. Exploration revealed no evidence of the kidney or a congenital residue. The peritoneum was opened and we found we were dealing with a huge gallbladder. The liver border was at the level of the iliac crest and the fundus of the large gallbladder (7 inches in length) extended into the pelvis. Adhesions of recent origin were present between the gallbladder and the parietal peritoneum over the ileopsoas muscle. A portion of the duodenum and the cecum were attached to the anterior surface of the gallbladder. There was a large amount of exudate on the parietal peritoneum adjacent to the attachment of the gallbladder. The gallbladder, which was tense, markedly thickened and which contained numerous stones of various sizes, was easily removed through the excellent exposure of this incision.

The case was thought to be of interest because of the difficulty of the preoperative diagnosis, because of the congenital absence of the right kidney, and because of the ease with which this large gallbladder could be removed through the unusual approach of a kidney incision.

Collins, in a discussion of congenital unilateral renal agenesia in 1931, stated that review of the literature revealed 572 cases. At that time nine additional cases were added from the Section on Pathologic Anatomy of the Clinic. Braasch stated that congenital absence of the kidney was probably not of great clinical significance but that a clinical diagnosis of agenesia would be impossible. Only the circumstances as existed in this case or a postmortem examination would ascertain this condition. He further stated that the value of Dr. Collins' data, other than being a contribution to renal pathology, lay in the fact that it emphasized the occurrence of solitary kidney.

Discussion

Dr. W. F. Braasch, Rochester: The clinical recognition of renal agenesia is not as rare now as it used to be. Since the advent of excretory urography, solitary kidneys are discovered rather often. Just because only one kidney is visualized in the excretory urogram, however, does not necessarily infer that the other kidney is absent because of agenesia. It must first be proved that the absence of renal function is not temporary and the result of a remediable cause. If the kidney is absent, one must determine whether the condition is congenital or acquired. The diagnosis of congenital absence of the kidney, or renal agenesia, can be made from the original roentgenograms because of several data. The outline of the congenital single kidney is much larger than that of the acquired single kidney and its position is much lower. Finding the kidney shadow on one side only, especially if the renal shadow is very large and is situated very low, would, in most instances, be very suggestive of renal agenesia.

The absence or dimming of the psoas shadow on the side of the absent kidney, with accentuation of the psoas on the other side, is often observed in the roentgenogram. I don't know why the psoas shadow should be diminished. I asked Dr. Scammon for information about this, but he was unable to give me any. Possibly it is caused by a failure of development of renal innervation and branches supplying the psoas muscle. Sometimes the psoas shadow on the side of the absent kidney is very broad and well developed. Corroborative evidence of agenesia is often derived from the cystoscopic examination. The interureteral ridge on the side of the absent kidney is usually undeveloped and the ureteral orifice is absent. Having the data available from the original roentgenogram and from the excretory urogram, if the psoas shadow on the side of the absent kidney is faintly visible and accentuated on the other side, one should be able to recognize renal agenesia in most cases.

Dr. F. E. B. Foley, Saint Paul: The title of this case report, "Renal Agenesia," is a misnomer. Obviously the gallbladder condition was the important thing with the renal anomaly merely an incident. This, however, does not detract from the interest of the latter. The condition was important in the diagnosis in this case and particularly so in being misleading.

Renal agenesia or congenital absence of the kidney not infrequently comes up for consideration in diagnosis. The condition exists in two forms. In one the congenital defect is primarily in the renal blastema. In that case a ureteral bud forms from the Wolffian duct and develops into a normal ureteral orifice and ureter of some length. Because of aplasia or absence of the renal blastema the kidney proper does not develop and the ureter ends blindly. In this event there is congenital absence of the kidney combined with a normally formed trigone, presence of both ureteral ridges, both ureteral orifices and on one side a ureter of some length ending blindly. In the second form of the condition of which this case is an example the congenital defect is primarily in the Wolffian duct. It fails to form a ureteral bud and no ureter develops. Even if the blastema is present it receives no ureteral bud and in consequence does not develop a kidney. In this form of the anomaly one side of the trigone, the ureteral ridge, orifice and ureter and kidney are all absent.

CHRONIC CONSTRICTIVE PERICARDITIS WITH CALCIFICATION

Report of Case

Moses Barron, M.D.

Minneapolis

The case I am presenting this evening is one that was sent to me with the diagnosis of heart disease. The patient had been treated for this condition for several years and had become bedridden during the previous six months. This type of case presents all the symptoms and findings of congestive heart failure but may also be confused with cirrhosis of the liver. An exact diagnosis was absolutely essential for the proper management of this case, since she did not respond to the usual medical management and required surgical interference, before any improvement was obtained.

A woman, aged forty-five, married, was first seen on August 15, 1938. She came in complaining of swelling of the abdomen of two years' duration, weakness of one year's duration, loss of weight, inconstant edema of the legs, and with symptoms so severe that she had been confined to her bed for six months.

Past history: In 1925, at the age of thirty-two, she had scarlet fever. During convalescence she developed acute rheumatic fever which laid her up for two months. She thinks that at that time her heart became involved. Following this she felt tired and noticed dyspnea on exertion. About a year later she was in an auto accident when her chest was crushed. She was taken to a hospital where she was told she developed pus around her heart, that is, a suppurative pericarditis. She stayed in the hospital only five days, when she was sent home. Her recovery was slow. Finally, she felt quite well again. She performed her usual duties until about two years ago, when she noticed progressive weakness and enlargement of the abdomen. Later she noticed her ankles would swell while she was up and around. She developed a peculiar pressure sensation in the chest which, together with the shortness of breath, made it difficult for her to talk at times. The abdomen began to swell and became so large that, in February, 1938, paracentesis was performed, when eight quarts of clear fluid was removed. This was repeated in June and an equal amount of fluid was withdrawn. She had been confined to her bed since the first paracentesis. During the past year she was given salyrgan and digitalis with very little if any relief. She had to be careful with her diet because many foods produced gas, belching and bloating. She had had a number of attacks of pain in the right upper quadrant which was diagnosed gallbladder disease about ten years ago. She has been free from these attacks lately.

Physical examination: The patient was 5 feet 3 inches tall, weighed 124 pounds, pulse 74, blood pressure 110/80. There was a slight edema of the lower back. The heart was apparently not enlarged, tones faint and impure, the pulse small and irregular, the heart was fibrillating. There were pulsations in the vessels of the neck, more on the right. The lungs were clear. The abdomen was large and presented all the evidence for the presence of a large amount of free fluid. The liver came down about 5 cm. below the costal margin, the edge was firm. Pelvic examination was negative. The blood showed Hb. 80 per cent, 8,600 leukocytes, with normal differential; Wassermanns were negative. The urine was negative. An electrocardiogram showed low voltage in all the leads, T_1 isoelectric, T_2 and T_3 slightly negative. There was slight slurring of the QRS in the second and third leads. Tracings were taken in three positions: with the patient on the back, on the right side and on the left side. All the tracings appeared alike, with practically no change in the different positions and presumably no shifting in the cardiac axis. A 6-foot heart radiograph showed the heart in midposition with marked calcification of the pericardium. It appeared as if the heart were enclosed in a calcium shell. The lateral film showed this even better than the antero-posterior view. Venous pressure showed a definite increase to 20 to 25 cm. of water in the antecubital vein (normal 5 to 8 cm.). There was a florid cyanosis. The diagnosis was constrictive pericarditis with advanced calcification.

Comment.—This patient presents very important findings for diagnosis. The ascites and the enlarged liver may suggest cirrhosis of the liver. However, there is a negative history of alcoholism and there was a marked dyspnea on the slightest exertion which is not common in cirrhosis. The increased venous pressure was definitely against such a diagnosis, if uncomplicated, as was also the electrocardiogram. The x-ray findings helped to rule out cirrhosis of the liver and establish the true diagnosis. The question of congestive heart failure came up for consideration but the marked increase in venous pressure in spite of the absence of cardiac enlargement pointed strongly against it. Such a combination is extremely rare in congestive heart failure. Another finding against such a diagnosis is the absence of evidence of pulmonary congestion in the presence of marked dyspnea on the slightest exertion.

In résumé, then, the essential findings for the diagnosis of constrictive pericarditis in this case were the increased venous pressure without cardiac enlargement, enlargement of the liver with marked ascites, dyspnea without evidence of congestion of the lungs, marked weakness, diminished apical impulse, low pulse pressure, fixation of the heart as found by physical examination as well as by fluoroscopy and electrocardiogram, and the finding of calcification of the pericardium. The condition may be described as "inflow stasis." An insufficient amount of blood is able to enter the heart chambers, which results in a diminished output. A similar condition is often brought about mechanically by severe tricuspid stenosis. In these cases the x-ray examination is exceedingly important. Fluoroscopic evidence of the absence of pulsations at the cardiac borders is very characteristic. In the present case the x-ray examination showed, in addition, the extensive calcification of the pericardium.

Treatment.—Medical management offers very little lasting relief in these cases. In only a few cases, where there may be some associated congestive heart failure, does digitalis prove of value. The only procedure which holds out promise for extensive relief in the majority of cases, and perhaps a practical cure in about one-third of the cases, is surgical interference. Decortication has proved to be life-saving in a large series of cases reported by many authors. The present case was referred to Dr. Owen Wangensteen of the University for surgical treatment. On August 23, 1938, Dr. Wangensteen operated under intratracheal anesthesia. The postoperative course was satisfactory and the patient was discharged from the hospital on September 10. She returned for a checkup the latter part of October. At this examination she was able to be up and around, with very little dyspnea. The ascites had completely disappeared so that the abdomen was flat. The patient said that she now feels well except for some weakness. However, the venous pressure is still above the normal. The x-ray now shows that the heart has now enlarged to the left, and that the left border has fair excursion. It is very likely that a secondary operation may have to be performed to relieve the right auricle and ventricle, which could not be done at the first operation. The improvement up to now has been most striking. Dr. Wangensteen will discuss the surgical phase of this type of case.

Discussion

Dr. O. H. Wangensteen, Minneapolis: I am grateful to Dr. Barron for the privilege of participating in the care of the patient whose condition he has discussed. He recognized the nature of the disorder. The disturbance having been identified, determination of the proper therapy was but a natural sequence.

Before discussing the surgical aspects of constrictive pericarditis, I should like to emphasize the physical criteria mentioned by Dr. Barron by which the disorder may be recognized. A high venous pressure as indicated by prominence of the jugular and antibrachial veins at heart level and a low arterial pressure and a small pulse characterize the condition. The apex beat may not be felt with the hand and fluoroscopically the limited motion of the heart is striking. The heart may appear small on a roentgenogram, but fluoroscopic visualization is more revealing. If saline solution is allowed to run from a glass tube into an arm vein with the arm at the level of the right atrium, the height at which the column of fluid comes to a standstill determines the venous pressure. These findings are the same whether tamponade of the heart is occasioned by blood, fluid or pus in the pericardial sac or by a thickening of the pericardium limiting and restraining the motion of the heart.

In 1898 the French surgeon Delorme[1] suggested that an operation might be done for constrictive pericarditis in which the thickened pericardium is divided and stripped from the heart muscle. He did not then do the operation, however. In 1902 Brauer[2,3] suggested that the ribs and cartilages overlying the heart be removed in those instances of constrictive pericarditis in which there was retraction of the chest wall in cardiac systole. Only those patients in whom adhesive bands from the pericardium attach to the anterior chest wall causing a tug on the chest wall during systole of the heart would be helped by such a procedure. In instances which meet the operative indication it probably would be well to take measures to preclude reformation of bone from the periosteal rib beds and the perichondrium. It is quite obvious, however, that the Brauer operation would be of no avail in the presence of constrictive pericarditis. The younger Rehn[4,5] was the first to do the operation suggested by Delorme some years before. It was, however, the conjoint effort of the internist Volhard and the surgeon Schmieden which established the practicability of the Delorme operation in the relief of constrictive pericarditis.[6]

I believe I am correct in saying that Churchill of Boston was the first in this country to operate successfully for the relief of this condition and that as recently as 1929.[7] The success with which Churchill has dealt surgically with the condition of bronchiectasis, establishes him as one of the keenest exponents of thoracic surgery in the world. He has reported recently[8] a group of eighty-four cases of bronchiectasis for which he did lobectomy with a mortality rate of 4.7 per cent. There was only one death in the last sixty-six cases—a really remarkable achievement when one appreciates the potentially formidable character of the operation.

In the aggregate, there must now be on record somewhere in the neighborhood of a hundred cases of constrictive pericarditis which have been treated successfully by operation. Schmieden's series has grown to twenty-two in number.[9] In this country Beck at Cleveland,[10] Churchill at Massachusetts General Hospital,[11] Blalock at Vanderbilt,[12] and Heuer at Cornell,[13] have each had a unique surgical experience with the condition. Harrington reports a successful instance in the current issue of the Mayo Clinic bulletin.[14]

As Schmieden has pointed out[15] the decortication should begin over the left ventricle. The right ventricle, of course, after opening the chest wall through a left para-sternal incision comes into view most quickly. If it be decorticated first the inflow stasis of peripheral vascular inadequacy to which the patient has in part accommodated himself may then be replaced by pulmonary edema—a tragic occurrence which Schmieden encountered in one of his early cases. Preliminary decortication of the left ventricle will permit it to deal with the restraint to "inflow stasis" which will accompany decortication of the right ventricle.

Both Schmieden and Churchill warn that attempts should not be made to remove scar from the thin atrial walls. The dissection must stop in the auriculo-ventricular grooves. Care, however, must be observed to see that the heart is loosened from the diaphragm inferiorly.

In the instance of Mrs. E. J., aged forty-five years, University Hospital No. 671539, reported by Dr. Barron, the pericardium was calcified and the heart encased in a stony, hard mould. The pericardium could not be cut with scissors or knife, but had to be trimmed away with bone shears. I decorticated the entire left ventricle and the anterior portion of the right. It is important to adapt the operation to the patient and not do too much at one sitting. It is noteworhy nevertheless that Schmieden completed all but one of his twenty-two operations in one stage. As Dr. Barron indicated, this patient has improved astonishingly. She left the hospital somewhat less than three weeks after the operation without evidence of edema or ascites and is still edema and ascites free. There is some slight residual evidence of fluid in the left pleural space, but this, I believe, is incident to the opening of the pleura at operation. Despite the fact that this patient appears clinically well, the presence of an elevated venous pressure (still 20 cms. of saline solution) indicates that it probably would be wise to remove the calcified pericardium from the entire right ventricle.

A prior experience with another patient suggests this also. Two years ago I removed the greater portion of the constricting pericardium from Mr. C. R., aged forty-two years, University Hospital No. 650540. He improved slowly, and the consideration of another operative procedure carried out through an incision in the right thorax was debated. Because of the technical difficulties of establishing the plane of cleavage between the thick pericardium, in the lamination of which encysted fluid had accumulated, and the epicardium, subsequent operation was deferred and the patient dismissed from the hospital. Three months later when he returned his condition was such that reoperation was out of the question.*

Constrictive pericarditis is a disorder which should be recognized readily. It is by no means a common condition. Surgery in suitable cases offers a direct and dramatic means of terminating heart failure and invalidism.

Dr. W. H. Condit, Minneapolis: What takes the place of the pericardium?

Dr. Wangensteen: A number of persons, Doctors Fahr, Sperling and myself among others,[16] have removed the entire pericardium in dogs and observed that the capacity of such dogs for work on the treadmill was equal to that of normal animals. Useful as the pericardium may be in preventing acute cardiac dilatation, it is not an indispensable membrane, for dogs seem to get on quite well without it.

Dr. F. R. Wright, Minneapolis: Has the patient gained anything? What has been accomplished by it?

Dr. Barron: The records from the literature show that 50 per cent of the cases are practically cured, even though not able to do any hard work. This patient is able to work around the house as long as she doesn't hurry. It has been about eight weeks since operation. If you could see that patient and see how comfortable she is, one would think the operation is worth while. There is still some constriction around the large vessels.

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*Since presentation of this paper a third patient with constrictive pericarditis has been operated upon (L. G., aged eleven years, University Hospital No. 639977). Diuresis following pericardiectomy was striking. The operation was performed November 25, 1938, and the patient is still in hospital convalescing.

PRIMARY CARCINOMA OF THE URETER

F. E. B. Foley, M.D.
Saint Paul

The case to be reported is of unusual interest because of the rarity of the condition it presents, the classical clinical features it showed including particularly a deformity in the pyelo-ureterogram characteristic of the condition and because of the particular form of operation employed. For the sake of brevity only essential details will be set forth.

A spinster, sixty-nine years old, was referred to me by Dr. Lepak on June 15, 1938, because of blood in the urine. Two weeks before Dr. Lepak referred her to me she had consulted him because of dizziness. Two days later she noted that the urine was colored with blood. Hematuria had never occurred before and she attributed it to drugs prescribed by Dr. Lepak. Hematuria was present with every urination from noon until going to bed at night. Following this there was no recurrence of gross hematuria. Dr. Lepak reported that the drugs prescribed could not be responsible for the hematuria. Dr. Lepak examined specimens of urine on several subsequent days. He found none of them grossly colored with blood but found in all of them a considerable number of red blood cells on microscopic examination.

On close inquiry in regard to pain suggestive of renal origin there was an account of a fall and striking the lower ribs on the right side followed by periods of slight pain and tenderness in this region ever since. The description of the pain, its character and location were not strongly suggestive of upper urinary tract origin.

There was no reaction to Murphy percussion on either side, there was no tenderness to deep bimanual pressure in either flank and neither kidney was palpable. No mass or tenderness could be made out in the abdomen. Well up in the vaginal vault on the right side lying close to the bladder wall and extending over to the pelvic wall, very definite induration and firmness could be felt. Apart from this the findings of the physical examination were negative. The urine was clear and the findings of the urine examination were all normal except for the presence of six red blood cells per high power field in the centrifuged specimen. The urinary tract radiograph gives a good outline of each kidney, the left being of normal size, configuration and position while the right is of decidedly smaller than normal size and rather low-lying. There is a small irregular shadow overlying the right margin of the sacrum remotely suggestive of ureteral stone.

The cystoscopic examination disclosed a perfectly normal bladder interior. A ureteral catheter ascended the left ureter against no abnormal resistance while on the right side an F6 ureteral catheter encountered strong resistance beginning 4 cm. above the orifice. Only by splinting the catheter with a wire stilet in its lumen could it be further advanced. Using some little force it ascended to the renal pelvis. Only 1 or 2 c.c.

of urine could be aspirated from the catheter in the left ureter while aspiration of the catheter in the right ureter obtained 30 c.c. of urine. Indigo-carmine given intravenously appeared promptly in good concentration in the urine dripping from the left catheter. At the end of 10 minutes the dye had not appeared in the urine dripping from the right catheter.

The bilateral pyelo-ureterogram is shown here. The calyces, pelvis and ureter on the left side are all quite normal. On the right side there is a grade 2 dilatation of the pelvis and calyces with the pelvis of rounded bulging type. The bulging pelvis overlies the uretero-pelvic junction, which is not visualized and leaves unanswered the question of uretero-pelvic junction obstruction. The ureter is dilated grade 2 from the kidney down to a point 6 or 8 cm. above the bladder. From here down to the bladder there is an irregular distribution of the contrast medium in the form of irregular tangled streaks not outlining definitely a ureteral lumen. The deformity is strongly suggestive of ureteral neoplasm with the ureteral lumen occupied by irregular soft papillary growth. The small irregular shadow overlying the right margin of the sacrum is outside the ureter and the possibility of it representing a ureteral stone is definitely excluded.

For consideration in diagnosis the salient features were:

1. The history of gross hematuria.
2. Long continued presence of red blood cells in the urine after cessation of gross hematuria.
3. The history of occasional pain or discomfort in the right flank.
4. The palpable induration in position of the pelvic portion of the right ureter.
5. The impaired function of the right kidney.
6. The dilatation of the right pelvis and ureter.
7. The typical deformity in the outline and filling defect of the ureter shown in the pyelo-ureterogram.

The features enumerated warranted the positive diagnosis of "ureteral neoplasm—probably primary."

Operation was performed July 6, 1938. Because of the patient's stature and the low position of the right kidney it was possible to make the "nephro-uretero-partial cystectomy" through a single incision instead of through a flank incision and second incision in the lower abdomen as usualy employed. The incision was started below the tip of the twelfth rib and extended obliquely forward and downward in the lower quadrant to the midline a little above the level of the pubes. This gave adequate room to satisfactorily expose the kidney, whole length of ureter and adjacent bladder wall. The whole procedure was extra-peritoneal. An elliptical section of bladder wall measuring about 2 x 4 cm. with the attachment of ureter and ureteral orifice at its center was removed.

The postoperative course was uneventful.

The removed kidney, ureter and section of adjacent bladder wall are here for your inspection. Lantern slides of photomicrographs show the histologic appearance of the growth. It is a primary carcinoma of the ureter.

The first description of a case of ureteral tumor was by Rayer in 1841 but was not verified by histologic examination. In 1916 only seventeen cases of the condition had been reported. In 1934 the number had increased to only sixty-one verified cases. Two years later the total number of cases verified by histologic proof was ninety-six, indicating, of course, an increase of interest in the condition rather than any actual increase in the frequency of its occurrence.

How frequently primary neoplasm of the ureter occurs is impossible to say. Among 22,000 autopsy protocols of the Bellevue Hospital from 1904 to 1935 only one case of primary carcinoma of the ureter is noted. Among 22,181 patients in the Brady Urological Institute of Johns Hopkins Hospital there were only three cases of the condition. From these observations and from the scarcity of reported cases in the literature it is obvious that the condition is remarkably infrequent.

The symptoms of tumor of the ureter are quite variable. The classical triad of hematuria, pain and tumor mass are present in only a small proportion of the cases. The symptom most frequently prompting medical care is hematuria. The growth obstructs the ureter and usually produces some degree of hydroureter and hydronephrosis with accompanying pain. If the tumor is located in the upper two-thirds of the ureter, it will not be palpable until of considerable size. When located in the terminal portion of the ureter, it may, as in this case, be palpable relatively early.

Before the advent of pyelography the condition was recognized prior to operation in only about one-fifth of the cases.

Discussion

Dr. W. F. Braasch, Rochester: Dr. Foley is to be congratulated on making the clinical diagnosis in the case of primary tumor of the ureter that he reported. We have observed eighteen cases with primary tumor of the ureter at the Mayo Clinic and they are now being reviewed by Dr. Counseller and Dr. Cook, preparatory to reporting them. Of the eighteen cases, the preoperative diagnosis was made in only ten. In the last few years the accuracy of diagnosis has improved as the result of excretory urography. In two of our cases the patient was operated on for hydronephrosis and the tumor in the ureter was found subsequently. In another case the kidney was removed elsewhere for hydronephrosis. It is evident, therefore, that when pyelectasis is visualized in the excretory urogram, the site of ureteral obstruction should be determined and neoplasm excluded. Most of these tumors occurred among male patients. According to the degree of malignancy, seven tumors were graded 2, seven were graded 3, one was graded 1, and one was graded 4. An angiomatous tumor occluded the ureter in one case. Granuloma of the ureter may also occur and be large enough to simulate a neoplasm. Distinguishing primary tumors from secondary tumors of the ureter is an essential step in diagnosis. In two cases in which we made the diagnosis of tumor of the ureter, the lesion proved to be secondary to a primary papillary epithelioma of the renal pelvis, which we failed to find during the preliminary examination.

The prognosis in these cases has not been very good. Most of the eighteen patients were dead within three years after operation and several died in less than a year. It is possible that removal of the portion of the bladder surrounding the ureteral opening may give somewhat better results, but it is doubtful. That the condition is, fortunately, rare is shown by the fact that only eighteen instances were found at the Clinic in many thousand abdominal operations. Nevertheless, it does occur often enough so that one must be on the lookout for it.

Dr. W. H. Condit (Minneapolis): What did the patients die of?

Dr. Braasch: Early metastasis into the surrounding lymphatics.

Dr. Foley: On October 12, approximately three months after operation, a small mass of induration high up in the right side of the pelvis could be felt on vaginal and rectal palpation. Whether this represents induration of the repair process or persistence or recurrence of the ureteral neoplasm cannot be said at this time.

The meeting adjourned.

A. G. Schulze, M.D., *Secretary*

Meeting of December 14, 1938

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, December 14, 1938. Dinner was served at 7 o'clock and the meeting was called to order at 8:10 p. m. by the vice president, Dr. Carl B. Drake, in Dr. LaVake's absence. Forty-eight members were present.

Minutes of the November meeting were read and approved.

Upon ballot the following men were elected as candidates to active membership in the Academy:

Dr. John Lepak	Saint Paul
Dr. Kenneth Phelps	Minneapolis

This being the annual meeting, the following were elected as officers for the year 1939:

President	Dr. Carl B. Drake, Saint Paul
Vice President	Dr. James Johnson, Minneapolis
Secretary-Treasurer	Dr. A. G. Schulze (reëlected)

The scientific program followed.

FILTERABLE VIRUSES IN RELATION TO TUMORS AND MALIGNANT GROWTH

Robert G. Green, M.D.
University of Minnesota
Minneapolis

Abstract

The principal defining characters of the ultramicrobes are a submicroscopic size and obligate parasitic growth within living cells. Their nature may be reasonably explained if it is recognized that the degenerative processes apparent in visible parasites are operative also in the world of microscopic parasites.

Typical of retrograde changes under conditions of parasitism are the modifications observed in the tapeworm, which, adapted to a parasitic existence in the gastrointestinal tract of animals, has entirely lost a digestive system of its own. It has long been my concept that bacteria and other microbes, in adapting themselves to parasitic life within cells, lose many vital functions which are available to them in the surrounding protoplasm, thereby become correspondingly smaller, and degenerate into the submicroscopic parastitic particles that we call filterable viruses.

In their adaptations filterable viruses are similar to bacteria and protozoa. To perpetuate their kind, viruses, like other parasites, must order their parasitic existence so as to gain a host, reproduce, and escape to a new host. The passage of the yellow fever virus through the mosquito is almost a duplicate of the complex adaptation of the malarial protozoan. It is recognized that the present status of the malarial parasite has been reached through a long series of evolutionary adaptations. The same appears true in the case of the ultravirus of yellow fever. Throughout their adaptations, viruses exhibit general properties common to the visible bacteria and protozoa.

Viruses as a group show a great diversity, and range from particles of visible size, and obviously closely related to microbes, down through submicroscopic particles approximating the size of large organic molecules. From this viewpoint, the viruses seem to be an extension of parasitic forms into the submicroscopic world through a series of intermediate sizes. Viruses, from these general considerations, appear to be biological species which maintain themselves as do pathogenic bacteria or protozoa and are attached to these visible microbes by intermediate forms.

It is now becoming evident that many proliferative lesions and tumors in animals are caused by viruses. The development by viruses of an ability to cause the cells in which they live to divide and expand their world of growth must be regarded as an adaptation favorable to the existence of viruses. The development of properties for an intracellular existence must depend upon a high degree of conformity of the physiologic processes of the parasite to those of the host cell. This is shown generally by the marked chemical inactivity of all obligate pathogens as compared with saprophytic bacteria.

The conformity of the physiologic processes of the intracellular parasite to those of its host, as an adaptation for parasitic existence, would probably, to a marked degree, be one of similarity. In the tangled metabolic processes of virus and host protoplasm, a proliferative virus might well substitute for a similar aggregate in protoplasm of the host and become anchored as a part of the cell. While this concept is speculative, investigations in this field are yielding information that supports some such concept. Rous has shown that the virus of the rabbit papilloma, which is demonstrable in the benign growth, cannot be obtained from the cancerous proliferation which often develops therefrom. Transplants of the cancer, however, appear to immunize against the virus. Kidd has found that from the Brown-Pearce carcinoma of rabbits a foreign antigen can be extracted which will give immune reactions with the blood of a rabbit afflicted with the tumor. Evidence of this type is accumulating which points to an intimate association of viruses with certain malignant growths, and seems to indicate that in these cases the virus is in some manner fixed within the malignant cell. At the present time research on viruses and their relation to tumorous growths is very productive. A concept of virus-fixation as a cause of malignant growths offers a possibility that at least cancers of a certain type may

sometime be prevented by immunization against viruses which cause precancerous lesions.

Discussion

Dr. Moses Barron (Minneapolis): Dr. Green's paper covers a very fruitful field for investigation since the origin of cancer is still undetermined. Because of the many different theories, one has to be very careful in drawing too strict conclusions.

Some twenty-five years ago Dr. Ervin Smith published a great deal on the production of plant cancer. He produced experimental tumors on various plants like crown-gall by the injection of the bacillus tumefaciens. At that time he brought out the parasitic theory of cancer, that is, that cancer is caused through the stimulation of cells by filterable viruses or bacteria. The work presented here tonight by Dr. Green is interesting in that he shows that certain types of papillomatous tumors in rabbits may be produced from the injection of what he considers a filterable virus obtained from such tumors. One has to think of the possibility that these tumors are produced from a simple irritation of some chemical substance. It is well known that certain chemicals, like tar, etc., will produce cancer when applied to the skin of different animals. I understand Dr. Green to say that not all animals inoculated with the filtrate of these papillomatous tumors develop papillomas. I believe he said that perhaps only one in a thousand or one in many thousand animals will result in cancer; that is, even if the tumors are produced, only a very small percentage will go on to the malignant stage. In animal experiments the cancer, therefore, may be not the direct result from the virus, but rather indirectly the result from the cellular proliferation which was brought about by the virus. There is one question which always comes to my mind whenever virus is presented as causing cancer. Since cancer cells develop from normal cells through a gradual transition during cellular proliferation, are we going to assume that the normal proliferation in growth and healing is also caused by a certain virus? Personally, I am not yet convinced that viruses in themselves produce cancer. Dr. Green's presentation is intensely interesting, but we must be careful in drawing too broad conclusions from results thus far obtained.

Dr. F. R. Wright (Minneapolis): A year ago in Philadelphia a paper was read at a research meeting giving the idea that malignant growths were due to protein colloid poisoning; that these individuals lived on protein-colloid-containing foods and that it was the over-use of the protein foods which tended to produce the growths.

Dr. C. B. Wright (Minneapolis): I would like to ask Dr. Green what progress has been made in can-

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cer studies from the standpoint of Dr. Rowntree's work on wheat germ oil?

Dr. Arnold Schwyzer (Saint Paul): I wonder about an experiment made by Lanz, later Professor of Surgery in Amsterdam, Holland; whether it would come in this study. The infectious character of a growth like a wart was accepted a long time ago by many. Lanz rubbed a wart into the skin of the back of his hand in a manner to form the letter "W." After some time one could see warty ridges on his hand in the form of the letter "W."

Dr. Green (in closing): I did not intend to suggest that viruses are the cause of all proliferation. As parasites they take advantage of the proliferative property of cells and stimulate it for their own benefit. Certain insects are capable of stimulating proliferation of plant tissues to form a gall which serves as a favorable habitat for their offspring.

The request for further information about vitamin E and colloid malignancies I cannot satisfy, as I do not know how far this work has been extended since the reports mentioned.

The comments of Dr. Schwyzer regarding warts are very significant. Little work has been done in attempts to demonstrate that proliferative growths in human beings are due to viruses. It is recognized that a wart is one human proliferative lesion caused by a virus infection.

BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

YOU CAN SLEEP WELL. The A B C's of restful sleep for the average person. Edmund Jacobson. 269 pages Illus. Price $2.00. New York. Whittlesey House, 1938.

Confronted with the dilemma of sacrificing accuracy for palatability, the author has attempted in "You Can Sleep Well" to be all things to all men. One day while riding on a train, a phantom traveling salesman sold the author the idea of collaboration, which probably explains the hyperkinesis and hypertensiveness of the style of writing. In the first sixty pages, this traveling salesman is allowed to run rampant through doctors' offices and over golf fields seeking a cure for insomnia. He tries the gamut of "cures" from ovaltine to aspirin, but without success. Then in desperation, on the verge of a nervous breakdown, he tries the new method of "progressive relaxation," and finally gets his much needed sleep. If the lay reader has difficulty in finding the gold in this large, hard nugget, let him turn to pages 92, 103, 114, 121, 130 and read the instructions on how to relax carefully, and then if he still remains awake, turn to the last chapter on "How the body falls asleep."

The reviewer hopes that the second edition will be written in the simple clear style of his first book, "You Must Relax." Max Seham.

* * *

ESSENTIALS OF OBSTETRICAL AND GYNECOLOGICAL PATHOLOGY. Douglass and Faulkner, St. Louis: C. V. Mosby Co., 1938.

Douglass and Faulkner, in their book on gynecological pathology, have composed an easily read manual covering the fundamentals of the subject. The book should be of especial value to students and to those practitioners who desire a quick, fairly comprehensive review of a specialized field. The text is well illustrated.

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EXPERIENCES IN THE MANAGEMENT OF FRACTURES AND DISLOCATIONS. Philip D. Wilson, M.D. 1036 pages. Illus. Price, $5.00. Philadelphia: Lippincott, 1938.

This book is, without doubt, one of the most important works dealing with the fracture problem which has been published in recent years. It is not a textbook but is a series of monographs setting forth the experiences of a number of experts in the care of fractures. Over four thousand fractures and dislocations occurring on the fracture service of the Massachusetts General Hospital between the years 1923 and 1930 were studied and the final results were evaluated. Every case in which the end-result has been determined is summarized and the history, examination, the original treatment and the final treatment are given. At the end of each section there are the conclusions which have been arrived at as the result of the study of the individual type of fracture. The mere fact that a group of men have been willing to set down the unprejudiced account of their experiences in the care of their fractures without any regard to good or bad results is enough to recommend this book as a valuable addition to any surgeon's library.

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THE SIGNIFICANCE OF NORMAL BLOOD SUGAR IN THE TREATMENT OF DIABETES MELLITUS*

JOHN R. MEADE, M.D.

Clinical Assistant in Medicine
University of Minnesota Medical School
Saint Paul, Minnesota

THE common teaching in medical schools until recently has been that adequate treatment of diabetes mellitus has two objectives—to maintain the blood sugar within normal limits and to keep the urine sugar-free. The normal level of blood sugar has been stated to be from 90 to 140 mg. per 100 c.c. of blood. This estimation refers not only to glucose but also to the other reducing substances in the blood which are generally included in the blood sugar reading. During the past ten years there has arisen a controversy as to how significant it is in the treatment of diabetes mellitus to achieve a normal blood sugar level, and the literature contains many pertinent observations by men who have been interested in the subject.

When diabetes was first described and treatment by diet alone instituted, it was very difficult to keep the blood sugar within normal limits except by reducing the patient to a state of severe malnutrition which usually led to coma and death unless the diabetes was very mild. Since the advent of insulin and since protamine zinc insulin has been available, malnutrition has ceased to be a problem. In fact, we are able now to maintain the diabetic at his ideal weight, rather than below this point, by giving enough insulin to keep the urine sugar-free without causing hypoglycemia. Experience has shown that it is difficult, in some patients, to keep the blood sugar within normal limits without causing hypoglycemic reactions.

Sugar usually appears in the urine when the blood sugar reaches a level of 170 mg. per 100 c.c., and this reading is taken by most authors to be the upper limit of renal threshold for glucose. In the treatment of diabetes we all encounter patients who manifest no glycosuria but who consistently have a level of blood sugar as high as 350 mg. per 100 c.c. These people are usually past the fifth decade of life and seem to remain in good health as long as the urine is sugar-free. Various reasons are given for the development of hyperglycemia in some patients and not in others. Porter and Langley,[6] after doing glucose tolerance curves on fifty normal individuals ranging from thirty to eighty years in age, concluded that the curves must be interpreted with regard to the age of the patient as well as to the height of the curve, because their study showed that the older the patient, the higher the curve, and the greater lag that occurred before it returned to normal.

John[2] compared the fasting blood sugar and urea of a thousand patients without diabetes and found a slight but uniform rise of blood sugar with each succeeding decade. The retention of blood urea was higher in the later decades also, but the blood urea was much higher in some of the cases than in others of the same age. This suggests that a common underlying factor, such as renal insufficiency, did not govern both of these elements. Mosenthal[5] thinks that the reason for higher levels of blood sugar without glycosuria in diabetic patients of advanced age is due to the greater power of reabsorption of the kidney tubules of the glomerular filtrate rather than to the lowering of the excretory power of the kidneys.

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*Read before the Ramsey County Medical Society, St. Paul, Minnesota, November 28, 1938.

Before the advent of insulin the average age at death of patients with diabetes was 44.8 years, whereas in the period since insulin has been available the average age at death has risen to 62.8 years. At the same time the incidence of arteriosclerosis in diabetes has risen, probably as a result of the fact that the patient with diabetes lives on into the age group in which we almost always find some degree of arteriosclerosis even in the non-diabetic person. It has been thought by many that hyperglycemia was directly responsible for arteriosclerosis in association with diabetes, but this opinion is not held by Joslin.[3] He feels that a high blood cholesterol has more to do with the production of arteriosclerosis than does hyperglycemia, and states in substantiation that children with a level of blood cholesterol higher than 300 mg. per 100 c.c., show evidences of arteriosclerosis and other disturbances of fat metabolism. It would seem then that hyperglycemia from the standpoint of production of arteriosclerosis is not as important nor as dangerous as has been described.

Soskings, Katy, Strouse, and Rubinfeld[7] have shown that in elderly individuals with diabetes and cardiovascular disease the symptoms of insulin hypoglycemia could be reproduced by lowering the carbohydrate fraction of the diet to a low level.

Infection, along with arteriosclerosis, is one of the major factors in the production of gangrene in diabetes, and it has long been thought by many that hyperglycemia makes the tissues more susceptible to bacterial invasion and growth. Handsman,[1] however, found that staphylococci did not grow any better in blood that contained as high as 1 per cent of dextrose than in normal blood, and furthermore that blood with a higher concentration of dextrose did not have a lower bactericidal power. These observations lead us to believe that a diabetic with hyperglycemia is not more prone to diabetic gangrene than is the diabetic who maintains a normal level of blood sugar.

According to Joslin,[4] our reasons for trying to establish a normal blood sugar without glycosuria in the diabetic are as follows: (1) Normal values are obviously the best. (2) Hyperglycemia is a stimulus to the secretion of insulin, and we do not want the impaired island tissue to be overworked. (3) Removal of glycosuria proves complete utilization of the carbohydrate fraction of the diet. (4) Hyperglycemia implies that the tissues also contain a higher percentage of sugar than normal, which supposedly leads to lack of tissue repair as well as lack of resistance to infection, and causes degenerative phenomena of the blood vessels and nerves. In regard to the last statement, however, Joslin does not find any difference in the speed of wound healing or increase in wound infection following operation in patients who have hyperglycemia without glycosuria. Joslin[4] says further: "We do not believe that a hyperglycemia up to 200 mg. per 100 c.c. of blood is particularly harmful to a diabetic provided that the urine is sugar-free, because this is proof that he is not eating his carbohydrates uselessly."

Wilder[9] states that he has seen two cases of peripheral neuritis develop in diabetics in whom the blood sugar levels had been lowered to normal or nearly normal values. The patients recovered when the insulin dosage was decreased and there was subsequent hyperglycemia but no glycosuria. Sunderman, Austin, and Williams[8] noted that some patients with diabetes had insulin shock reactions with blood sugar levels of 200 mg. per 100 c.c. of blood if the value for blood sugar fell from a higher level after the administration of insulin.

I have attempted to analyze the courses of fifty-four patients with diabetes, about 90 per cent of whom have been taking only one dose of protamine zinc insulin before breakfast and who have maintained a urine free from sugar (Table I). All of these patients are on a well-regulated diet, consisting of a basal number of calories plus various percentages, depending on the type of occupation of the patient. Of this group all the patients over thirty years of age have a hyperglycemia, which is correspondingly higher in the older patients. At various times when I have endeavored to reduce the hyperglycemia of these patients I have met with hypoglycemic reactions, together with most strenuous objections on the part of the patients. Subjectively they are irritable, and they neither feel as well nor do their daily work as well as when

TABLE I. AVERAGE FASTING BLOOD SUGAR READING IN FIFTY-FOUR WELL CONTROLLED DIABETIC PATIENTS

Age Groups	Number of Cases in Each Group	Average Blood Sugar in Mgs.	Clinical Arteriosclerosis	Slight to Moderate Gangrene
30-39	14	151	2	0
40-49	13	159	7	1
50-59	12	172	9	4
60-69	9	194	9	6
70-79	6	224	5	4

the hyperglycemia is present. These patients all have maintained their normal weight.

I think we all have seen older patients who have had anginal seizures when the blood sugar was reduced to normal although there were no other clinical signs of hypoglycemia.

We must insist, of course, that all diabetics, except those in the older age group with coronary disease, keep the urine sugar-free, because prolonged glycosuria, if it is at all marked, will end disastrously for the patient. Dehydration with consequent lowered resistance to infection, malnutrition, acidosis, coma and possibly death are what we may expect of prolonged glycosuria.

In conclusion, I wish to emphasize that a blood sugar within normal limits and a urine free from sugar are ideal conditions for the patient with diabetes only as long as he remains in a good state of nutrition and does not have hypoglycemic reactions. However, I think we should not strive to achieve a normal status in the glucose level of the blood in diabetes at the expense of the patient's feeling of well-being. Although much of the teaching regarding the treatment of diabetes mellitis has been to the contrary, men with large experience in this field have found that hyperglycemia without glycosuria is not harmful to patients with diabetes. My own experience substantiates this to the extent that I feel that hyperglycemia without glycosuria does not cause as much harm to the patient as has been thought in the past and that arteriosclerosis and gangrene, so dreaded in diabetes, are not due alone to hyperglycemia without glycosuria.

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ACUTE SURGICAL CONDITIONS OF THE ABDOMEN*

J. M. HAYES, B.S., M.D., M.S., F.A.C.S.

Assistant Professor of Surgery, University of Minnesota
Minneapolis, Minnesota

NO branch of surgery yields greater mortality than acute surgical conditions of the abdomen. Preoperative diagnosis here is often most difficult and may be impossible. Good surgical judgment, perhaps, is the most important factor in reducing morbidity and mortality in these cases.

Acute surgical conditions of the abdomen have been confused with the following: lead-poisoning; gastric crisis of tabes; diabetic acidosis; diaphragmatic hernia; central pneumonia; and coronary and mesentery thrombosis.

It has been suggested that pain, nausea and vomiting with constipation continuously for more than six hours should lead one to seriously consider surgery.

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*Read before the Northern Minnesota Medical Association, Crookston, Minnesota, August 29, 1938.

The presence of diarrhea may obscure or change the entire picture. An acute enteritis may and frequently does lead to a poorly advised laparotomy. Such an operation usually not only does not better the patient, but may change a rather mild condition into one which is very serious. On the other hand an acute enteritis should be followed closely lest the picture change later into an acute surgical condition.

A good history and physical examination with all applicable laboratory assistance may give us a clue to otherwise very indefinite conditions.

In no other condition is it more imperative to make the diagnosis early. Disastrous changes may take place rapidly and the safest time for operation may have slipped away if the diagnosis is not made early. Incorrect diagnosis and poor surgical judgment has led to many unnecessary laparotomies. This fact has done much to bring the profession into disrepute with the public.

Appendicitis is still the most frequent surgical condition in the abdomen. It constitutes about 50 per cent of all abdominal surgery. In spite of our recent improved aids in diagnosis and technic the mortality in appendicitis is on the increase.

The mortality from appendicitis in the United States in 1920 was 11,000.[1] In 1937 it was 20,000. Why there should be this increase in mortality we do not know. No doubt self medication is a large factor. Also failure of the patient to report to the physician at a time favorable for cure plays a large part in this increasing mortality. However, the profession must take at least some part of the blame for this almost tragic truth.

In some parts of the country an educational program is being put on to teach the public how they can aid in reducing this mortality. Perhaps this should be made national in scope.

In the typically severe, acute case of appendicitis there is usually general agreement among the physicians and surgeons that immediate operation is the treatment of choice. In the more indefinite case the patient may be slow to report and the physician may have difficulty making a diagnosis.

In general, pain, nausea and vomiting, right rectus rigidity, and a high leukocyte count in a patient who has been well up to a few hours previously should strongly suggest an acute surgical appendix.

With a retrocecal appendicitis the muscle rigidity may be almost absent. The pain, nausea and vomiting may be slight or almost absent, yet we may have a severe appendicitis. In this case if other conditions are quite well ruled out and the leukocyte count has risen rapidly over a short period of time, a surgical appendix must still be seriously considered. If the leukocyte count rises to twelve or fifteen thousand or above and other symptoms point to appendicitis one is usually safe in advising appendectomy.

When these patients come to us late and the possibility of a ruptured appendix is likely, there is considerable difference of opinion among the best surgeons as to how best to treat them.

If there is good evidence of localization and symptoms are subsiding one may be justified in waiting for the inflammatory process to cool down before opening the abdomen. This, though, is hard to determine definitely. We cannot always be sure whether the appendix is ruptured or not. So often the process continues with no let-up and slight localization that the treatment of these cases is still in dispute.

The surgeon who has seen a number of these patients go on without localization or any let-up in symptoms to a fatal end usually advises operation as soon as the diagnosis is made. Personally, I favor the latter course. Unless there is a well walled off abscess and the appendix is plainly part of that wall, I remove the appendix even in the face of perforation. Good drainage is instituted and I believe much can be done to promote drainage and lessen the virulence of the infection by the application of a large, wet, antiseptic pack.

Acute cholecystitis is the most frequent upper abdominal surgical condition. In acute cholecystitis we do not include the acute gallstone colic in which a hypodermic of morphine relieves the pain and the patient goes on to an uneventful recovery. Nor do we necessarily include the patient who shows improvement in the course of one or two days.

We refer here only to the patient who goes on to progressively increasing acute inflammatory symptoms, as evidenced by increasing temperature, leukocyte count, and general toxicity. In the treatment of these cases there is much difference of opinion among the leading surgeons of the world.

It is my belief that patients most seriously ill with acute cholecystitis do not commonly reach the great surgical centers. They are often too sick for distant transportation. I believe the reason for such great divergence of opinion among surgeons in the treatment of these cases is that they are not talking about the same type of cases.

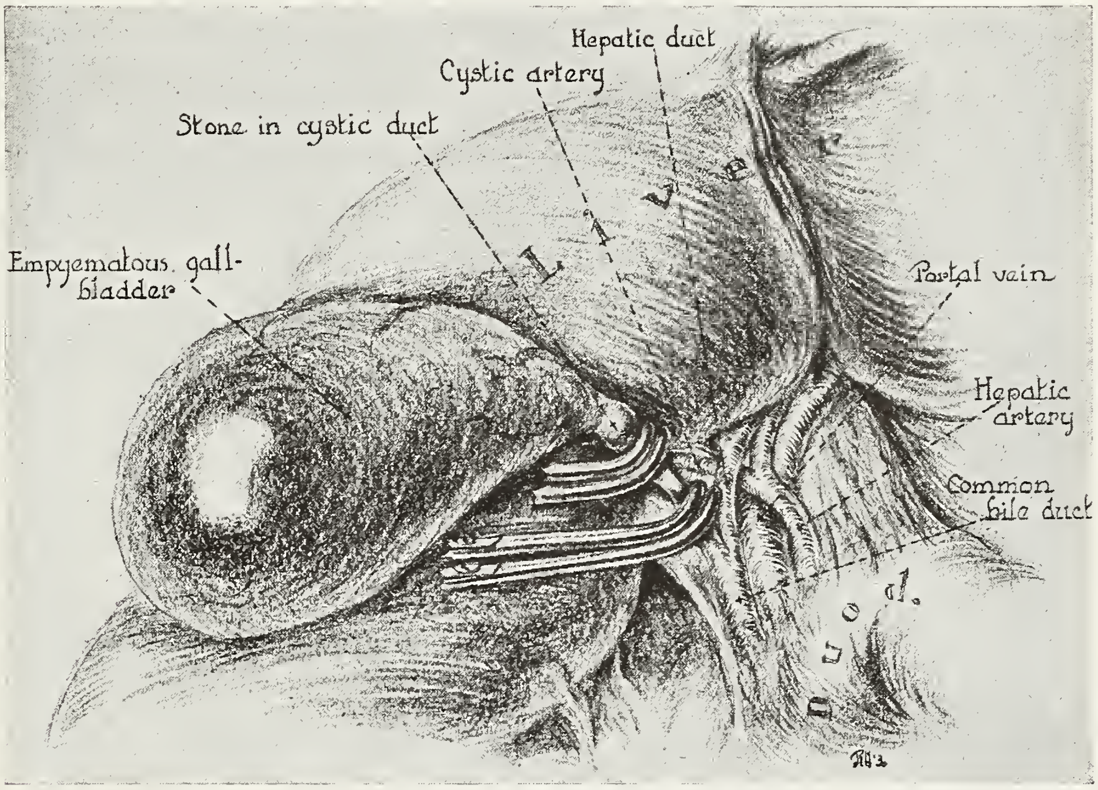

Fig. 1. Drawing of acute empyema of the gallbladder. This shows the stone in the distal cystic duct pressing on the cystic artery. The portion of the cystic duct between the clamps appears about normal. The inflammatory process here is confined almost entirely to the gallbladder. It has not yet become adherent to adjacent organs.

Such men as Everts Graham advise conservative treatment, waiting to operate until the acute process cools down. He states that he has had a very small mortality in those treated conservatively. On the other hand Lahey says, "The more experience I have with acute cholecystitis the more I lean toward immediate operation, and total removal of the gallbladder when it can be done."

Sir James Walton of London gives a summary of this condition which my experience leads me to regard most favorably. He concludes with the statement that this operation is one of difficulty and associated with much risk. I therefore unhesitatingly advise that the onset of acute cholecystitis should be regarded as a grave emergency and that immediate operation should usually be advised.

Payne of Virginia found twenty-nine gangrenous gallbladders in sixty-five cases of acute cholecystitis.

Saunders of Tennessee reports forty-five perforations with 17.4 per cent mortality.

Huer of Yale in a series of acute cases reports 20 per cent perforations and gangrenous gallbladders.

Some surgeons have been fortunate in having most acute cases localize and subside; others have had just the opposite experience with cases that originally appeared about the same. Some years ago the late Dr. Dennis of St. Paul called attention to the fact that a stone in the distal end of the cystic duct usually produces pressure on the cystic artery and is likely to result in gangrene or empyema of the gallbladder. Close to the common duct the cystic artery and duct are far apart, but as they approach the gallbladder they approach each other. A stone at this latter point is more likely to interfere with the circulation of the gallbladder. No one can be sure before exploring where the obstruction of the cystic duct may be.

Personally I have had thirty cases with obstruction in the distal end of the cystic duct or pelvis of the gallbladder. All of these patients showed evidence of gangrene or empyema of the gallbladder. Nineteen were operated within seventy-two hours with no mortality and very little greater morbidity than in the ordinary chronic gallbladder. The twentieth patient, operated upon after two weeks, died. Of the remaining ten cases the gallbladder ruptured into the peritoneal cavity in three, one of the three dying before we could open the abdomen. The other two recovered after a very stormy convalescence. Of the remaining seven, perforation occurred posteriorly and pus burrowed upward posteriorly behind the liver, through the diaphragm and into the pleural cavity. Pus and bile were aspirated from the pleural cavity. Later the gallbladder was removed with much difficulty. Of the remaining six, three were drained, and the gallbladders had to be removed later. The remaining four drained for periods of from two to six months. Two closed after drainage but had to be reopened two or three times before final closure. All of these patients were very sick, with gradually increasing symptoms. The leukocyte count in all these cases ranged from 15,000 to 27,000.

This experience has led me to favor the advice of Lahey and Sir James Walton, that these gallbladders should be removed as soon as the diagnosis is made, or at most during the first twenty-four to forty-eight hours.

Intestinal obstruction is a frequent abdominal surgical condition. It carries a high rate of mortality. Recent advances in our knowledge of this condition are of great assistance. The knowledge that an alkalosis develops rather than an acidosis indicates what fluids should be administered. Nasal suction is a great help but may be used to disadvantage and unavoidable surgery may be delayed. Nasal suction may relieve the patient and fecal material may be obtained with enemata, still there may be a closed loop bound down firmly by adhesions that can be relieved in no way except surgically. In these cases every hour of delay increases the risk. Early surgery, relieving the obstructing bands or ileostomy, should give good results.

In children intussusception is quite often the cause of obstruction. They may be relieved by traction or non-operative procedure but operation should not be long delayed, if relief is not otherwise readily obtained. In all cases of obstruction the x-ray is invaluable in determining the presence and location of the obstruction.

Perforating ulcers of the gastro-intestinal tract are surgical and exploration should be made at the earliest possible moment. During the war general orders were given to refrain from operation in cases of perforation when it could not be undertaken within the first twenty hours.

Nature frequently does a good job of sealing over the perforation. After twenty hours we frequently tear loose this sealing process and spread the infection. Abel has said of the perforating peptic ulcers that he has lost none operated upon during the first six hours after perforation and has had only one live after twenty-four hours. If done early, drainage of the wound is usually not necessary; if late it is advisable to drain through a low stab wound. Severe pain, board-like rigidity of the abdomen, shock, and collapse are usually present. Closing the perforation and covering it with a tab of fat is usually sufficient in emergency cases.

Ruptured ectopic pregnancy is fairly common. A history of pregnancy, if obtainable, is valuable. Frequently this cannot be obtained. Bleeding from the vagina is next most important, but may not be present. There is usually sudden, severe pain with distention. Muscle rigidity is not usually so marked as in appendicitis. The pulse is frequently rapid and thready. The temperature may be subnormal, and symptoms of collapse may be present. If on the right side it may be impossible to differentiate from an acute appendicitis. In appendicitis the leukocyte count is usually higher in relation to other symptoms. Surgery is indicated as soon as the diagnosis can be made.

Acute pancreatitis is somewhat rare. The diagnosis is usually difficult. It is usually thought to be secondary to cholecystic disease. If the diagnosis can be definitely made, the patient may do well under conservative treatment. Cholecystotomy and cholecystectomy are frequently done in these cases, sometimes because gallbladder disease cannot be ruled out, and again because the surgeon considers this the best means of curing the condition.

In the acute hemorrhagic type, no treatment yet attempted has been very effective. Here again the gallbladder is frequently drained with the hope of possible relief.

Twisted ovarian pedicle is quite rare, yet frequent enough to give us some worry. On the right side it is frequently confused with appendicitis. The pain here is usually more continuous but the muscle rigidity is not so marked as in appendicitis. The abdomen is more distended. The leukocyte count is not so high in proportion to other symptoms. The pain usually continues until relieved by operation.

Jaundice may exist with or without pain. Intermittent jaundice without pain, with a history of chills and fever, general malaise, bile in the urine and clay colored stools, usually means the catarrhal type. However, a large stone in the gallbladder with secondary inflammatory process may produce enough pressure on the common duct to give this same picture. The cause of a continuous jaundice for more than two weeks must be definitely determined if operation is contemplated.

Gradually increasing jaundice for over six weeks, continuously, should suggest carcinoma of the head of the pancreas. Stone in the common duct may give much the same picture, but usually the jaundice is somewhat intermittent and pain is more likely to be present. In any event if operation is to be attempted one should not wait more than two weeks from the time of onset of the jaundice.

In all acute progressive conditions of the abdomen the resistance of the patient rapidly lessens. No other type of surgery requires more careful preparation of the patient, choice of anesthetic, or handling of the viscera once the abdomen is opened.

TORSION OF THE OMENTUM AND APPENDICES EPIPLOICAE*

Report of Two Cases

BENJAMIN F. DAVIS, Ph.D., M.D.
Duluth, Minnesota

THE first case is one of torsion and beginning gangrene of the omentum.

The patient was a white woman, forty-five years of age. She entered the hospital on the afternoon of June 26, 1930. On the preceding night, she had been awakened by a sudden severe pain in the right side of the abdomen, radiating to the right side and back, with vomiting. This was very soon followed by the development of extreme tenderness and moderate distension.

General examination was negative. There was extreme tenderness, with muscle spasm and rigidity, in the right upper quadrant of the abdomen. The temperature was 99.6°, pulse 120. The urine was normal.

The diagnosis of an acute abdominal condition, requiring immediate exploration, was made, with a high-lying appendix the probable condition.

The abdomen was opened under spinal anesthesia. There was exposed immediately a mass of omentum, about 15 cms. long, 8 cms. wide and 3 cms. thick, arising by a pedicle from the omentum of the transverse colon, near the hepatic flexure; the pedicle was twisted rather tightly several times on itself. The strangulated mass of omentum was mottled, dark purplish-red in its upper portion and almost black distally. It was quite hard and friable. The pedicle was clamped, cut and tied with catgut. The appendix lay to the immediate right of the cecum and was adherent to the cecum and mesocecum. It was quite hyperemic and was, therefore, removed. The abdomen was closed in layers, without drainage. The patient made an uneventful recovery.

The outstanding features of this case were the sudden onset, with vomiting, the fairly constant, severe pain, radiating to the back, and the extreme local tenderness.

No preoperative blood study was made.

Compared with other acute surgical lesions of the abdomen, torsion of the omentum is relatively rare. Jeffries[4] in 1931 collected 169 cases from the literature and reported four new cases. I have found approximately twenty additional cases published since 1931, which would make a total of about 193 cases.

The cause of torsion of the omentum is somewhat speculative; however, there are certain fairly constant factors which seem to be present in most of the cases. In Jeffries' series of 169 cases, 147 were associated with right inguinal hernia. Niemeier,[6] writing in 1935, distinguished two types of the disease: (1) primary or idiopathic torsion, comprising about 13 per cent of the cases and distinguished by the absence of adhesions about the omentum, and (2) so-called secondary torsion, comprising about 87 per cent of the cases. In the majority of this 87 per cent, the distal end of the omentum was adherent in a hernial sac, while in a small minority the adhesion was to some other point in the abdomen.

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*Read before The Duluth Surgical Society, February 24, 1938.

Other factors involved in the production of this condition are: (1) an exceptionally large omentum; (2) a long pedicle; (3) a narrow attachment of the pedicle; (4) a relative increase in the bulk of the distal portion of the omentum, as by a deposit of fat, cyst formation or edema; and (5), as stated above, a point of distal fixation. It is evident that the importance of these various factors varies in different cases. Each may be the predominating cause at times, although, doubtless, the torsion is produced usually by a combination of causes. Farr and Bachmann[2] believe that the first 90° of torsion is produced by peristaltic action and then, since the veins are longer than the arteries, and more easily compressed, as venous congestion develops, the torsion tends to increase correspondingly. This idea is speculative, unsupported by experimental evidence, but should be considered in conjunction with the factors commonly found in association with the disease.

The involved portion of the omentum undergoes changes relative to the degree of torsion and the duration of the disease. There may be simply marked passive congestion or, at the other extreme, complete necrosis. At the meeting of the Western Surgical Association in Madison, Wisconsin, about five years ago, Dr. David Straus of Chicago reported a patient on whom he had operated a considerable period after the onset of symptoms. He had pulled out practically the entire omentum, black and necrotic, through a small abdominal incision.

The signs and symptoms do not permit of an accurate preoperative diagnosis and the correct diagnosis is practically never made before operation. In a series of seven cases reported by Farr and Bachmann,[2] the preoperative diagnoses were as follows: (1) acute cholecystitis; (2) subacute cholecystitis or perforating gastric ulcer; (3) acute appendicitis; (4) acute appendicitis; (5) acute cholecystitis; (6) undetermined; (7) chronic appendicitis (acute exacerbation). The signs and symptoms are those of an acute abdominal emergency. Treatment is surgical and the prognosis following treatment is good.

The second case is one of torsion of an appendix epiploica.

The patient was a man, thirty years of age. He stated that, at about noon of the day of examination, he had been seized with a sudden severe pain in the left lower quadrant of the abdomen which had persisted. On examination, there was found a localized area of acute tenderness, with muscle spasm, in the left lower quadrant of the abdomen. The W.B.C. was 18,700, pulse rate 96, temperature 98.6°; there was no nausea or vomiting. The patient's gallbladder and appendix had been removed some years previously.

A probable diagnosis of acute diverticulitis was made and the patient sent to the hospital.

He was operated on about 5:15 P. M. of the same day, under ethylene anesthesia. The abdomen was opened by a muscle-splitting incision in the left lower quadrant. Lying in close contact with the parietal peritoneum, at a point directly under the area of tenderness located clinically, was an appendix epiploica, which was a deep purple in color and apparently the seat of intense passive congestion. No definite sac connecting it with the lumen of the bowel was found although it was connected to the bowel by a narrow isthmus which was tightly twisted on itself by several turns. This was clamped, cut and the stump was buried with a Lembert suture. No other abnormality was found. The abdomen was closed in layers without drainage. The patient made an uneventful recovery.

The pathologic diagnosis by Dr. A. H. Wells was as follows:

Gross.—Specimen consists of an appendix epiploica measuring 2.3 x 1.3 x .5 cms. This shows a diffuse reddish discoloration and is unusually firm. However, the cut surface is unusually friable. It has a delicate pedicle measuring about 2 mm. in diameter which at this time is twisted through several complete turns.

Microscopic.—Sections show fatty tissue with severely congested vessels and areas of moderate neutrophilic infiltration and petechial hemorrhages.

Diagnosis.—Torsion of appendix epiploica with strangulation.

The first reported case of this condition was made by Littre[7] in 1703, who found a small white stone, the size of a pea, in the free abdominal cavity of a cadaver he was dissecting. No evidence was produced to show that this was an appendix epiploica but it appears to be accepted as the first case reported.

In 1924, Klingenstein[5] reviewed the history of the diseases of the appendices epiploicæ and reported four cases from the Mt. Sinai Hospital, New York. In two cases, the appendix epiploica was incarcerated in a hernial sac; in one, a twisted appendix was found adherent to an appendix vermiformis; in the fourth case, a twisted and acutely inflamed appendix epiploica was discovered at autopsy in a case of acute hemorrhagic pancreatitis. He found recorded at that time twelve cases of foreign bodies in the peritoneal cavity, presumably representing appendices epiploicæ; seventeen cases of intra-abdominal torsion; ten cases of intra-hernial torsion; thirteen cases of intra-hernial incarceration and three cases of intestinal obstruction due to adherent appendices epiploicæ.

In 1933, Patterson[7] again reviewed the literature and found fifteen additional cases of torsion of the appendices epiploicæ, four cases of intra-hernial strangulation and two cases of intestinal obstruction.

Fiske,[3] in 1936, again reviewed the literature, finding forty-two cases and adding two more. He omitted from his review all cases reported as torsion within a hernial sac and as loose foreign bodies within the peritoneal cavity.

The appendices epiploicæ are small pouches of peritoneum, filled with fat. Bland Sutton[7] described them as "localized pedunculated overgrowths of subserous fat directly continuous with the fat in the mesentery." They are found along the mesentery of the appendix and on the large intestine as far as the rectum. As a rule, they are arranged in two rows along the anterior and posterior longitudinal bands, and are more numerous and larger on the sigmoid than elsewhere. They vary in size and shape. Some have been reported 15 cms. in length, but the average is 3 or 4 cms. They may be cylindrical, flattened or lobulated. According to Robinson[7] they are present at birth. They have been credited by some writers with a protective function similar to the omentum. This conclusion was drawn because they have been found adherent to inflamed organs, but such relationship is a natural consequence of infection. Robinson pointed out that their structure is so unlike the omentum that it is improbable that they have the same function. Basing his idea on certain experimental studies, he suggested that they might have some function in relation to the movement and absorption of fluid from the large intestine. Patterson[5] has suggested that they might act simply as bumpers for the large intestine, fending this organ from the parietes and the other viscera, thus facilitating peristalsis. Their location and simple structure would support such a view. Cheever[7] bluntly states that the appendices epiploicæ are useless.

Appendices epiploicæ may be involved: (1) secondary to disease in adjacent or contiguous tissues; (2) by primary inflammation; (3) by torsion of the pedicle; (4) by incarceration in a hernial sac, with or without torsion; and (5) by undergoing calcification and appearing as loose bodies intraperitoneally, probably as a result of one or more of the above affections. No malignant changes have been reported in them. It has been suggested that some cases of apparent strangulation may be due to primary thrombosis of the vessels in the appendix.

From the clinical side, intra-abdominal torsion and hemorrhagic infarction of the appendices epiploicæ is a definite entity. The most characteristic symptom is abdominal pain over the site of the lesion, in many instances associated with localized tenderness. Nausea and vomiting are uncommon, as is also a palpable tumor, which has been described in only seven cases. Changes in the blood count have not been reported in most instances but there was definite leukocytosis in our case. The disease has resulted in complications causing death in three cases. It is readily relieved by surgical operation. The pre-operative diagnosis is difficult. In the presence of any obscure pain which is not explained by operative findings, explore the appendices epiploicæ. It may be that some of the cases of abdominal pain of unexplained origin, which subside spontaneously, may be due to strangulation of the appendices epiploicæ.

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RATING OF DISABILITIES*

MYRON O. HENRY, M.D.
Minneapolis, Minnesota

THE principles of permanent partial disability estimation are well explained in McBride's textbook, entitled "Disability Evaluation," and the author, with his colleague, Dr. E. T. Evans, furnished the Minnesota-Dakota Orthopedic Society with a rating schedule for permanent disabilities of the extremities some years ago. More recently, Dr. George Dunn and others have published helpful papers on estimation of disabilities of the extremities. Loss of motion, muscular atrophy, loss of stability, shortening, and loss of sensation are generally considered in evaluating a disability, and the estimation of pain is really the only variable in rating disabilities of the extremities. While there are no fixed rules, conscientious surgeons, who are familiar with the law and with accepted methods of estimating disability, usually arrive at fairly uniform results in rating disabilities of the extremities.

Many other factors, which Stern has aptly called "variables," often enter into estimates of disabilities, and these variables, particularly, give rise to misunderstanding, uncertainty, and dispute. All of the surgeon's knowledge, experience, and sagacity may be required to evaluate such variable factors fairly and impartially.

Variable Factors

1. *Accident.*—Under the Minnesota Law the employee must be "injured by accident arising out of the course of his employment," separate statutory provision being made for occupational disease. Kessler defines accident, from the medical standpoint, as "an unexpected event, happening suddenly, producing a quick result, and coming from without." The disability need not be sudden, but may follow a trivial accident insidiously (as in osteomyelitis of the radius following a sliver in a finger).

The surgeon frequently must determine whether or not the present disability would inevitably result from the accident described. He must have due regard for the claimant's statements in order to be fair, yet he must "be alert to detect fraud, exaggeration, or malingering lest it be a reflection on his probity" (McBride). Disability produced by accidental means usually has some objective sign of external violence; it is usually produced immediately by the accident and should be continuous since the accident. Often the examiner must decide whether the particular accident described actually did produce the disability in question, or whether it probably or possibly did produce, or even could have produced, the disability.

2. *Congenital Abnormality.*—Sometimes anatomic variations and congenital malformations confound the evaluation of disability. Accessory bones in the foot are often mistaken for fractures, especially the accessory scaphoid (os tibiale externum), the accessory astragalus (os trigonum), and the bipartite sesamoids of the great toe. Open epiphyses may be mistaken for traumatic injuries—for example, the epiphysis of the iliac crest, the tip of the acromion process, and the separate tibial tubercle. Cervical rib and the scalene syndrome may produce disability similar to that of trauma. Malformations of the fifth lumbar vertebra, especially such as unilateral sacralization, non-fusion of laminæ, spina bifida occulta, and malposition of the postero-lateral articulations, cause much confusion when injuries are superimposed upon them. Some orthopedic surgeons believe that such malformations predispose to injury, or are more susceptible to injury, and that they recover more slowly from injury; others hold that they are merely incidental findings. Spondylolisthesis is particularly perplexing, and calls for thorough investigation before offering an opinion as to its traumatic origin. The majority of these cases are congenital with malformed zygapophyses, and forward dislocation obtains insidiously. Traumatic dislocation does obtain rarely, as in falls from a height when landing occurs in the sitting posture astride an object, but such cases may be expected to show later reactionary changes on the x-ray.

3. *Pre-existing Diseases.*—A number of comparatively rare bone diseases are conceded to be traumatic in origin, but, because they require

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some time after injury in order to develop sufficiently for diagnosis, their origin may antedate the accident in question. Such are, Kienbock's disease, which is now generally admitted to be a traumatic malacia of the carpal semilunar; osteochondritis dissecans of the knee which develops a loose body; and Pelligrini-Stieda's disease, which is characterized by a semilunar bony formation over the internal condyle of the femur and results from trauma. Careful investigation is necessary to determine whether the trauma is old or recent in cases of snapping jaw, snapping hip, and even in snapping thumb which is due to the stenosing tenosynovitis of de Quervain. Similarly, bursitis, whether subacromial, olecranon, prepatellar or radio-humeral, is attributable to trauma which may be recent or remote. Cystic menisci, discoid cartilages, ganglions, and Baker's cysts are probably not due to any single trauma or accident.

Certain unrecognized diseases may produce injuries which the claimant honestly considers due to an accident. Osteoporosis of bone, especially of the spine, allows fracture from trivial causes; Charcot joints may give way unexpectedly, producing fractures; cerebral hemorrhage or epilepsy may cause a fall; the tabetic may fall while at work; and many bone tumors are found only after pathological fracture.

4. *Aggravation of Pre-existing Disease.*—This is the much abused *bête noir* of disability rating and is especially difficult to evaluate in many cases.

(a) *Arthritis.*—Aggravation of pre-existing dormant arthritis assumes external violence of sufficient intensity to produce changes, and the violence must have been applied directly to the area in question, with the symptoms of aggravation appearing within ten days of the accident. In the presence of pre-existing chronic focal infection (with advanced hypertrophic changes demonstrable by x-ray), it is exceedingly difficult to estimate the exact amount of aggravation caused by trauma, separate from the progress of the disease. Isolated joints, with arthritis excited or aggravated by trauma, present a problem which is simple compared to that of the spine. Here the function prior to injury is hard to establish even though hypertrophic spurs indicate disease which has been present for years. Unfortunately, there is still some honest difference of opinion regarding aggravation of pre-existing spondylitis. McBride is of the opinion that "hypertrophic changes are not traumatic, nor can they be aggravated except by actual fracture," while others hold that injury can, and often does, aggravate such pre-existing spondylitis to a disabling degree. It must be admitted by all, however, that aggravation, if it does obtain, is only temporary, and that such temporary aggravation must eventually cease, allowing the disease to continue its normal course. In the author's experience, such aggravation cannot reasonably be presumed to be disabling beyond three months without demonstrable fracture.

(b) *Gout.*—Arthritis urica, of course, is not caused by trauma, but a definite external injury to the affected part may excite an attack in the individual having the gouty diathesis. The attack must follow the trauma immediately, and is only temporary, seldom leaving permanent disability through aggravation *per se.*

(c) *Infection.*—One of the most difficult conditions to arbitrate is infection aggravated by injury. This is because the infecting injury is often trivial or overlooked, or because the injury superimposed upon pre-existing infection (or both) seemed of no importance at the time. The incubation period of bacteria becomes important in such cases, and this is reasonably four days for direct infections and three weeks for exacerbation of antecedent infection.

(d) *Osteomyelitis.*—Aggravation of pre-existing chronic, or healed, osteomyelitis by trauma is generally accepted. The established trauma, however, must be moderately severe and certainly should leave objective signs of external injury. The signs of renewed inflammatory activity should follow immediately, certainly within three weeks of the injury, and probably within three or four days.

(e) *Tuberculosis.*—Healed, or quiescent tuberculous joints, may be aggravated by trauma, and the same postulates obtain, namely, a proved accident with immediate and continuous disability, with renewed and continuous activity of the disease appearing within a few weeks.

(f) *Malignancy.*—Trauma may call attention to pre-existing tumors and, if sufficiently severe to cause hemorrhage or to actually injure the substance of the growth, may accelerate its progress. Presumably injury may precipitate metastases and thereby hasten the progress of the disease.

The foregoing are some of the factual variables presenting in cases to perplex the surgeon; there are also other less tangible variables which may operate to influence his judgment. Disfigurement, age, occupation, personal acquaintance, and various other psychic factors may prejudice the surgeon, unconsciously. The demeanor or attitude of the patient himself, the fee involved, or the prospect of advantageous business connections may sway his judgment, even though subconsciously.

The estimation of permanent impairment is not simple, and even with the aid of precise instruments of mensuration, it often cannot be reduced to mathematical exactness. A fair rating depends, first of all, on a careful history, thorough examination, reliable records, and a well-grounded knowledge of the subject; it also depends upon an unbiased and impartial attitude on the part of the surgeon. Experience reveals that many cases have improved with the return to activity that follows settlement of claims, reminding us that conclusions as to permanent disability should not be hastily drawn.

Furthermore, we should remember that the work of disability rating is perhaps seen, reviewed, and criticized more frequently by others than any other part of the surgeon's work. Considerable responsibility is thus thrust upon the surgeon rating disability; he must be fair to both sides and, at the same time, uphold his own integrity and the honor of his respected profession.

Discussion

Dr. R. M. Burns, St. Paul: Dr. Henry has presented a very instructive discussion on some of the unusual problems involved in rating industrial disabilities. His statement that "The conscientious surgeon usually arrives at a fairly uniform result in rating disabilities" is true and encouraging.

It is well when rating disabilities for one to keep in mind the purpose of the law. A New York Court Dispatch states concisely the purpose:

"The plain purpose of the Compensation Law is to make the risk of the accident one of the industry itself, to follow from the fact of the injury, and hence that compensation on account thereof should be treated as an element in the cost of production added to the cost of the article and *borne by the community in general.*"

The phrase "borne by the community in general' is of prime importance and should be carefully considered. Frequently, doctors, lawyers and others lose sight of this fact and imagine that they bear the burden of the law. In the end, the public pays.

Referees and commissioners want estimates of the loss of function expressed in concrete terms. They want the relationship between the injured part and the normal part expressed in terms of percentage. They do not want the estimate to be a guess and after all there is no reason why it should be a guess.

There are a number of good articles on the subject of rating and there are textbooks which are of assistance but we should not pay too much attention to schedules or textbooks. These are to be used as guides and not dictators in rating disability. The law does not demand that the rating be done according to any particular system or to the teaching of any particular authority.

I am sure that Dr. Henry hit the nail on the head when he said, "A fair rating depends first of all upon a careful history, thorough examinations, reliable records, and a well-grounded knowledge of the subject," to which I add, competent consultation.

The rating of industrial disabilities, particularly in the variable and difficult cases is no *one-man's* jom. The aggravation of existing diseases may easily involve every phase of medicine. Such conditions as Kienboeck's disease, arthritis, and malignancy immediately call for consultations from the roentgenologist and the pathologist.

An accurate diagnosis of the present injury and of the concurrent pathology are indispensable. A false conception of the patient's physical condition at the start will give trouble all through the case.

I wish to re-state Dr. Henry's closing remark: "Considerable responsibility is thus thrust upon the surgeon rating disability; he must be fair to both sides, and at the same time uphold his own integrity and the honor of his respected profession."

Every doctor should feel happy when his estimates have been declared satisfactory. He should also feel chagrined when he finds his estimates have been declared to be at variance with ordinary common sense. He must always bear in mind the interests of the employee, the employer and "the community in general."

SURGICAL CLINICS OF EUROPE

Some Personal Observations Made in 1937, 1938

LOUIS SPERLING, M.D.*

Minneapolis, Minnesota

WHILE making a tour of the clinics of western Europe, I was impressed by the friendly reception accorded American visitors, especially by those men who had visited in the United States. I was also impressed by the progress being made in the modernization of hospitals and by the attempts to carry out research in spite of obvious financial difficulties, and, in some places, in the face of political interference. There is a distinct effort being made throughout Europe to do good research. This is particularly true in the British Isles. I liked especially the clinics of England, Scotland and particularly those of the Scandinavian countries. The Scandinavian clinics now occupy the high position formerly held by the German and Austrian universities.

The British Isles

In London, I was fortunate in meeting Professor George Grey-Turner, chief of surgery at the British Post Graduate Hospital. The British Post Graduate Hospital is the newest and best equipped hospital in London. Here, graduate education in surgery is carried out in much the same manner as it is in our own centers for postgraduate study. In spite of being at the retirement age, Professor Grey-Turner came from Newcastle to assume the responsibilities of teaching in the surgical service at this hospital.

The ward rounds were most interesting and instructive. There were several cases of carcinoma of the esophagus in which radical resection by stages was being demonstrated. Such a case, operated on by Professor Grey-Turner in 1932, survived for nineteen months, succumbing subsequently to intercurrent nephritis. Carcinomas of the tongue are treated by teleradiation, followed in eight weeks by radical surgery if there is no marked decrease in the size of the lesion. The incision is made across the cheek, splitting the mandible if necessary. A Crile neck dissection is done if the nodes are involved. The Newcastle incision for acute appendicitis, popularized by Professor Grey-Turner, is the same as the McBurney incision except that the internal oblique muscle is cut, giving better exposure. In contrast to the policy at the University of Minnesota hospitals, every case of acute appendicitis is operated upon regardless of the stage of the disease.

The treatment of perforated ulcer was discussed at a meeting of the Royal College. The opinion, at this session, was that a conservative measure, *i.e.,* simple closure, was the treatment of choice. Professor Grey-Turner reported 365 cases of perforated peptic ulcer. In this series, the total mortality was 15 per cent; 267 cases of twelve-hour history had a mortality of 8.6 per cent; 119 cases, with only a six-hour history, carried a 3.6 per cent mortality. Professor Grey-Turner questioned the permanency of the results of splanchnic resection for hypertension. Mr. A. J. Watson, in charge of the department of orthopedics, is an ardent exponent of manipulative surgery. His attitude is typical of a large number of British orthopedists. He demonstrated the Hey-Groves apparatus for pegging fractures of the neck of the femur. By its use, only a small incision is necessary and good reduction is obtained. The only objection is that the procedure requires the insertion of a sharp nail dangerously close to the femoral artery. Mr. Watson-Jones of Liverpool later told the writer of a case in which he had punctured the femoral artery with this instrument.

Sir James Walton, at the London Hospital, is one of the few English surgeons who prefers the conservative operation of gastro-enterostomy for peptic ulcer, reserving gastric resection for the few cases in which complications follow the first operation.

Guy's Hospital, like all large London hospitals, has its own medical school. The students have two years preliminary training in the basic sciences, then go directly into a three-year clinical period. There is nothing corresponding to our internship. Practice is allowed after completion of the hospital work, but there is the opportunity to become a resident in the hospital in surgery, medicine or the specialties for a period of six months to a year. Mr. Ogilvie of Guy's Hospital, like the vast majority of continental surgeons, is an advocate of subtotal gastric resection for peptic ulcer.

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*From the Department of Surgery, University of Minnesota. Minneapolis, Minnesota.

At St. Bartholomew's Hospital, Professor J. Patterson-Ross did an orchiopexy, anchoring the testicle in the scrotum on the opposite side of the septum. He stated that he had previously done a Keetly-Torek type of operation but had abandoned it in favor of this procedure. He is still doing total thyroidectomy on patients with angina pectoris. He also illustrated the conservative treatment of carcinoma of the breast with radium needles alone, recently described by Keynes, who claims 30 per cent cures over a five-year period; this percentage is the same as it was in previous years when radical surgical procedures were employed. There is considerable interest in peripheral vascular diseases at St. Bartholomew's. Conservatism is the rule in the surgical treatment of diabetic gangrene. Arteriograms, showing two types of Buerger's disease, were demonstrated: one with major occlusion of the popliteal artery or its branches, the other with peripheral arteritis. Most of the cases of Buerger's disease are being subjected to lumbar sympathectomy. A new unit for x-ray therapy at this hospital overshadows even our supervoltage machines. It has a maximum capacity of 1,600,000 volts.

In Liverpool, I visited with Mr. Watson-Jones, one of the younger English orthopedists, who has taken over much of Sir Robert Jones' work. He, like Professor Archibald Young, is opposed to skeletal traction, especially through the condyles of the femur or through the olecranon because of the commonly attendant complications in the knee and elbow joints. He insists that the whole of the semilunar cartilage should be excised and prefers to make a small posterior incision if necessary. Visco paste dressings (Unna's paste) are applied after the removal of plaster casts. Instead of an iron walking caliper, a rubber sponge is incorporated in the walking cast. Arthrodesis of the hip joint with a nail is advised for severe osteo-arthritis. There is, subsequently, surprisingly little disability in spite of the stiff hip.

In Edinburgh, Sir John Fraser and the late Sir David Wilkie were in charge of surgical services at the Royal Infirmary. They were using a combined streptococcus and gas bacillus serum in appendiceal peritonitis. For burns, both Fraser and Wilkie used 1 per cent rosanilin dye followed by 10 per cent silver nitrate. In his new experimental laboratory, Sir David Wilkie demonstrated his method of making massive block sections of whole organs. By this method, in a large series of cases, he was able to demonstrate areas of tuberculosis in every kidney in which tubercle bacilli were isolated in the urine. He showed me some specimens of resected carcinomas of the rectum together with the lymph nodes from which massive block sections had been made. At Wilkie's surgical seminar a paper was presented by Light, of Toronto, who discussed the increase from .2 per cent in 1931 to .9 per cent in 1936 of pulmonary embolism in Toronto. Forty per cent of all patients with postoperative pulmonary embolism had had, and 12 per cent of all operations had been done under spinal anesthesia. A surprisingly high percentage with pulmonary embolism had had no operation but had succumbed to this condition while lying in the medical wards. He discussed the significance of the recent adoption of Gatch beds in the hospital, which, by virtue of making the patient more comfortable, made it less necessary for him to move about in bed. There was also an interesting paper by Engel, a German refugee, who is working on the permeation of dyes through synovial membranes of joint surfaces. He demonstrated that acid dyes permeate the joint because of their smaller molecular structure and lipoid solubility. Basic dyes do not come through because they are lipoid-insoluble.

Intratracheal anesthesia is very popular in Scotland. Anesthesia in the British Isles is always administered by a physician anesthetist.

In Aberdeen, Professor James Learmouth, formerly of the Mayo Clinic, was very much interested to know what was going on in Minnesota. His associates, Mr. Anderson and Mr. Smith, are in charge of surgical services in the New Aberdeen Infirmary. I had the opportunity to see several cases of intestinal obstruction and to set up an apparatus for decompression of the bowel by nasal suction siphonage. Professor Young, of Marshall College in Aberdeen, is very much interested in pressure changes in osteogenic sarcomas and believes in surgical decompression of the bone to prevent distant metastasis. In the wards of the Aberdeen Infirmary, there were several cases of fractured patella in which the entire patella had been removed with apparently good results.

In Glasgow, Professor Archibald Young, chief of surgery at the Western Infirmary, had been nailing fractures of the neck of the femur since 1924. He reduces many fractures by the open method, and, although he is quite liberal in the use of internal fixation with metal appliances of all sorts, he does not favor any type of skeletal traction.

France

The French surgeon works without the aid of a scrub nurse or an extra assistant and does quite well, despite what would appear to us to be great handicaps. The charity hospitals of Paris are very poor; the wards are crowded. Most of the hospitals in France are run by the State, which spends too large a proportion of its income on armaments to permit very elaborate hospital facilities. The latter is likewise true of Germany and Italy. Only in France are Reverdin needles used. Spinal anesthesia by the Jones method with percain 1-1500 is the anesthesia of choice. General anesthesia is usually induced with ethyl chloride. In amputation for diabetic gangrene the stump is left open with skin traction on the flaps. Healing is not delayed and complications are avoided. Leibovicei, in Cosset's Salpetriere Clinic, is doing one stage abdomino-perineal excision for carcinoma of the rectum, leaving the patient with a sacral (perineal) anus.

In Strassbourg, Professor Fontaine, at the Leriche Clinic, is producing hypertension in dogs by resection of the carotid sinus and a portion of the vagus nerve. For the first time, I saw suction cups applied to the chest in postoperative respiratory complications. Several cases of asthma were relieved by injections of the stellate ganglion with novocaine. Sympathectomy was almost a routine procedure in all cases of Buerger's disease and often was a preliminary procedure in amputations for diabetic gangrene. The anterior approach for the removal of the stellate ganglion is still preferred.

Holland

The hospital of the University of Leyden is organized much like the University Hospitals are here. The chief of the surgical service is Professor Suermondt. Subtotal resections of the stomach for peptic ulcer are done with only a 3 per cent mortality. Cases of very painful arthritis of the hip joint are treated by section of the obturator nerve or by spraying the nerve repeatedly with ethyl chloride. Varicectomy is still being done for varicose veins. Injection of varicose veins is not carried out in this clinic. For cardiospasm, an operation similar to the Ramstedt-Fredet procedure in hypertrophic pyloric stenosis is done, cutting the muscle fibers down to the mucosa of the esophagus and stomach.

At the Hague, Professor Michaels has replaced Professor Jans Schoenmaker, who is now retired.

Professor Nordenbros is in charge of the surgical department of the new Wilhelmina Hospital in Amsterdam. He is using the fibula for fusion osteosynthesis of fractures of the neck of the femur and for bone grafts elsewhere. The treatment of appendicitis there is much like that in our own University Hospitals. In fact, he is one of the few in Europe who advocates conservative treatment of perforated appendictis with peritonitis.

Sweden

The largest clinics in Sweden are located in Lund, Stockholm, Uppsala and Göteberg. These University clinics are among the most progressive in Europe. They are financed by the government and seem to have sufficient funds for research and new equipment. State medicine is well organized in Sweden. Most of the doctors are apparently well satisfied with the system. Everyone is eligible for care at the county and municipal state hospitals at the cost of less than $1.50 a day. The physicians are paid by the state and may, of course, have private practices.

At the University of Lund, Professor Petren is in charge of a surgical division of 225 beds. The hospital was built in 1888 and has had several new additions. A new unit is now being added by the government. Professor Petren has not been won over to the Johannson method for fractures of the neck of the femur, preferring to treat them by a Whitman cast or skeletal traction. Here, I saw a child, eight years of age, with acute cholecystitis with stones. In the southern part of Sweden, there is a very definite goiter belt which is similar to our Great

Lakes region. Osteomyelitis is a very rare occurrence in this part of Sweden.

Professor Sven Johannson in Göteberg was kind enough to demonstrate his operation for internal fixation of fractures of the neck of the femur and allowed me to make some motion pictures of the procedure. Postoperatively, his patients are kept in a semi-Trendelberg position for a week to minimize the danger of thrombosis. Amputated stumps are left open in cases of diabetic gangrene. He showed a case in which he had made a serviceable thumb for a boy by implanting a tibial bone graft into the first metacarpal and covering it with a pedicle graft from the abdominal wall. Like Leriche, he advocates peri-articular injections of novocaine to facilitate early active motion in fractures involving joints. Several cases of advanced carcinoma were being treated with fever therapy.

The Radiumhemmet, in Stockholm, is headed by Professor Berven, who visited here in 1933. The institution was formally opened in October, 1937, and has 130 beds for cancer patients only. It is supported by the King Gustav Fund of 5,000,000 kronen. There is available eleven grams of radium; five grams are in one bomb, three grams in another, and three grams are utilized for radium needles, etc. There are eight new machines of 200,000 voltage for deep x-ray therapy. Next to the Memorial Hospital, in New York City, the Radiumhemmet has more radium than any other cancer institute. Until two years ago, all patients receiving radium therapy had to be treated at the Radiumhemmet. Since then two similar but smaller radium institutions have been established, one at the University of Lund and the other in Göteberg. At the Radiumhemmet there are separate buildings for the study of the physical and the chemical properties of radium. Carcinoma of the tongue and mouth are being treated with teleradium. Fifty per cent of all cases of cancer of the mouth, pharynx and larynx seen at the Radiumhemmet are in young women. Swedish medical authorities associate this with the fact that simple achlorhydric anemia or "Plummer Vinson syndrome" is common in Sweden. Pipe smoking, which is very common among Swedish women, may also be a factor.

Professor Einar Key, "Dean of Swedish surgery," is now retired, his position being filled by Professor John Hellstrom. Professor Key is in private practice and is supervising the building of the new Karolina hospital in Stockholm. Professor Hellstrom, at the Maria Hospital, is doing much urology, although he is chief of general surgery. He demonstrated a patient ninety-one years of age, in whom he had nailed a fracture of the neck of the femur. To facilitate the taking of blood, he is giving donors for transfusion small doses of Heparin. Papaverine is used intravenously to relieve both renal and gallbladder colic, and is kept on the wards for emergency use in cases of pulmonary embolism. Professor Olivecrona of Stockholm is the dean of neurosurgeons in Europe. Most of the younger men who are doing neurosurgery at the various clinics have been trained by him. Professor Nystrom, at the University of Uppsala, is using a new, light-weight type of paper-glue cast, designed by Hulten, to immobilize fractures.

Germany

The operating rooms in the average German hospital are larger than our own. There are three or four operating tables in each room. Septic cases are strictly isolated and are usually operated upon in another part of the hospital. On the whole, asepsis is not carried out to the degree to which we are familiar. In many places neither caps nor masks are worn. If masks are used, they are of poor texture and material and are worn over the mouth alone.

At the Charité Hospital in Berlin, I visited in Sauerbruch's Clinic. Unfortunately, there was no opportunity to witness any chest surgery. While the assistants were properly attired with masks, caps, and gloves of "bona" rubber, the professor disdained these encumbrances. Eighteen cases of inoperable cancer of the rectum were reported cured (1934-1938) by Choual, the radiologist in Sauerbruch's Clinic. The growth is exposed posteriorly through an incision and heavy doses of x-ray are applied directly to the tumor.

In Hamburg, I spent several days at the Eppendorfer Krankenhaus with Professor Konjetzny. The clinic is one of the oldest hospitals in Germany, built on the pavilion system in 1850. Konjetzny is probably more conservative regarding resection of the stomach for duodenal ulcer than anyone else on the continent.

Professor Löhr in Magdeburg has a surgical service of 300 beds in a 1500-bed hospital. He trust only "in God and cod liver oil," and has done more to popularize the treatment with cod liver oil for burns and infections of all sorts than anyone else. Professor Löhr's operation for chronic osteomyelitis is as follows: The infected bone is removed, the cavity is saucerized and irrigated with saline solution to remove all bony particles, and then filled with 30 per cent cod liver oil ointment; no packing of any kind is left in the wound. The skin is closed loosely with interrupted silk suture. Zinc paste and cod liver oil ointment is spread over the skin and a cast is applied and left on for three or four weeks. The cast is bivalved as swelling usually follows such a procedure. In cases of acute osteomyelitis, he incises the periosteum only, fills the wound with cod liver oil ointment and puts on a circular plaster cast. The cast in the acute cases is not bivalved as swelling which usually is present decreases. Professor Löhr claims that 75 per cent of cases of acute osteomyelitis treated in this manner heal without sequestrum formation. If sequestra do form, the usual radical operation for chronic osteomyelitis is done after eight to twelve weeks. Large doses of cod liver oil are given by mouth in the treatment of peptic ulcer. He claims that the ulcer heals like any other wound (bathed in cod liver oil). Incidentally, the patients are kept in bed. He is also injecting a purified form of cod liver oil into arthritic joints claiming that it relieves pain. Several cases of ununited fractures of the tibia were treated by Beck's multiple drill method with resection of a piece of fibula. Arteriograms of the brain are made by puncture of the internal carotid artery. Professor Löhr demands clearer indications for gastric resection in cases of peptic ulcer than previously, and states that in the northern part of Germany there is a general swing toward conservatism in the management of peptic ulcer.

In Leipzig, Professor Willy Rieder has succeeded Payr as chief of the largest surgical clinic in Germany. Rieder is one of the youngest and most progressive chiefs of clinics in the Reich and is very cordial to visitors. The fracture service is very large and patterned after that of Boehler's in Vienna. Rieder is an excellent operator. A carcinoma of the gallbladder was resected together with a portion of the liver. He anchors the peritoneum to the skin edges to protect the wound from contamination. All laparotomy wounds are covered with an electric light cradle lamp instead of dressings. Buerger's disease is treated by sympathectomy. Thirty-three cases of ten-year follow-up were presented; 40 per cent of these were back at work.

Professor Georg Magnus has come to Munich from Berlin to succeed Lexer who has recently died. He is in disagreement with Boehler regarding the treatment of fractures generally and especially of fractures of the spine. He prefers to have his patients lie in bed without reduction for six weeks and then to get them up without braces. He claims good results in a high percentage of cases. Fractures of the neck of the femur are treated by wire traction reduction only.

The new surgical hospital in Tübingen is one of the most modern hospitals in Germany. It was completed five years ago under the supervision of Professor Kirschner who is now in Heidelberg. At Tübingen, Professor Kirschner has been succeeded by his pupil, Professor Willie Usadel, who demonstrated Kirschner's method of spinal anesthesia in which spinal fluid is replaced by air. He also showed Professor Kirschner's apparatus for local anesthesia by pressure infiltration. Professor Usadel is enthusiastic about getting patients up immediately after operation and advocates setting-up exercises in bed beginning the second postoperative day. He has gone back to the two stage procedure for the removal of carcinoma of the rectum. Professor Usadel is of the opinion that antiserum is of definite value in appendiceal peritonitis. He uses a light weight steel support to re-inforce plaster spica casts. For Buerger's disease, he gives a papaverine preparation intravenously, and follows this with sympathectomy.

At Heidelberg, I found that Professor Kirschner was in Berlin on military duty. A new hospital being built for him by the government is still not complete. Kirschner's operation for perineal prostatectomy and his procedure of fulguration of the Gasserian ganglion for trigeminal neuralgia were demonstrated by his Ober-Artz. The Gasserian ganglion has been fulgurated in over 300 cases of neuralgia with satisfactory results. The apparatus for x-ray control of this procedure has been developed to a fine degree.

Austria

I think that asepsis in Professor Wolfgang Denk's Clinic in Vienna is superior to that in any central European clinic. Professor Denk uses muscle tone tests as an index of the patient's general resistance and of his ability to withstand a major operation. There has been no diminution in the number of gastric resections done in Viennese clinics for peptic ulcer. In gastric resections for carcinoma, all of the greater omentum is removed together with the lesion. Felsenreich, in charge of fractures in Denk's clinic, is especially interested in osteosynthesis in fractures of the neck of the femur. The nail he uses is somewhat larger than the Smith-Peterson nail. He has had some excellent results and has summarized his cases in a recent book.

Professor Finsterer, who is still very active, does gastric resection even in cases of bleeding duodenal ulcer. He has resected sixty-four such cases with only four deaths. These deaths were from pneumonia. In young individuals, he prefers the Haberer type of subtotal resection and thus removes less of the stomach. He has had one death in a series of thirty-three cases of perforated peptic ulcer in which he did subtotal gastric resection. He has a total of twenty-one cases of total gastric resection. Five of his cases are still alive. He resects carcinoma of the rectum in one stage and states that he has done 210 cases in which he has been able to preserve the sphincter. The rectal sphincter is preserved in 60 to 70 per cent of his cases by a one stage operation with anastomosis of the proximal colon to the rectum just above the sphincter

Boehler, at the Unfall Krankenhaus, is an enthusiast over complete immobilization for infections and treats even potentially infected wounds by immobilization in plaster casts—methods which have been in use at our University hospitals for some years. He treats fractures of the shaft of the femur by skeletal wire traction through the tibial tuberosity for four weeks, and then skin traction of the thigh and leg by means of Unna's paste bandage traction. He is most impressive in his treatment for compression fractures of the spine. These fractures are reduced immediately under local anesthesia by forceful reduction and then a nonpadded plaster body cast is applied. In cases with paralysis, he reduces the fracture and says he has found it unnecessary to do laminectomy. The duration of fixation depends on the angle of the deformity of the fracture line. If there has been a 12° deviation, the plaster is left on for twelve weeks, if 20°, the plaster is left on for twenty weeks. The plaster applied is always nonpadded. Patients are allowed to be up and about immediately and started on active exercise. He always has a half dozen cases on hand who go through a regular circus type of exercise doing acrobatic stunts which patients with normal backs could not perform. Boehler is definitely opposed to any form of physiotherapy such as baking and massage and says this type of treatment promotes bone atrophy, skin discoloration and stiffness of the joints. He is a firm advocate of active motion only. He uses no type of gas or tetanus antiserum and has seen only one death from gas gangrene in 5,000 cases of compound injuries. This one death followed injury of the popliteal artery. He has had four cases of tetanus in 40,000 cases of injury with only one death.

In Budapest, Hungary, Professor Novak presented ten cases of esophagoplasty which he had done for stricture of the esophagus following burns. He first does a Witzel gastrostomy and four to six months later implants the distal end of a loop of the jejunum into the stomach and the proximal end into the abdominal wall in the epigastrium. Then the esophagus is sectioned and brought out to the left side of the neck and eventually a skin flap tube is made to connect both fistulas.

Switzerland

In Basel x-ray therapy is advocated by Professor Henschen for all types of infections. Routine x-ray therapy (1/5 skin unit) is recommended as prophylaxis for thrombophlebitis. In Professor DeQuervain's clinic in Berne, prophylaxis against thrombophlebitis is attempted by injection of a solution of Heparin into the wound. For hemostasis in hemophilia, an extract of thyroid tissue (colloid goiter) is being injected. Another hemostatic, manetol (Bayer), is an extract of nerve tissue of the brain and spinal cord of the guinea pig. In Zurich, progynon is being used in the treatment of Buerger's disease by Clairmont. DeQuervain is now at retirement age and will be succeeded by Mattis.

Italy

Putti's Clinic is situated high on a hill overlooking Bologna and is one of the oldest hospitals in Europe. It has been modernized recently and has beautiful wards and ultra-modern equipment. With new technique, x-rays are developed within seventeen seconds in the operating room, obviating the need of fluroscopy. The Italian officers who sustained wounds of the bones and joints in the Ethiopian and Spanish wars are cared for in this clinic.

I visited Professor Ascoli, surgical director of the Forlanini Institute in Rome. This new institute, recently built by Mussolini, has 1,400 beds for the treatment of tuberculosis; the surgical division has over 200 beds. Every visitor is proudly escorted through the entire building, which is one of the most modern institutes in all Italy. Professor Ascoli advocates anterolateral thoracoplasty, doing a phrenic exeresis with resection of the fourth, fifth and sixth ribs through a lateral approach. Two weeks later the upper stage is done through an upper axillary incision.

Comment

Anyone who has had the necessary fundamental training and preferably a certain amount of postgraduate experience, cannot fail to gain a great deal from a visit to foreign surgical clinics. I would recommend, however, that most of the time be spent in the British Isles and in the Scandinavian countries. There the friendly reception and hospitality is better than it is in central Europe which has been over-run in the past by those seeking postgraduate training. The language difficulties which beset the average traveller are also less bothersome in northern Europe. English is taught throughout the Scandinavian countries and is spoken in all of the clinics. It is my impression that clinical and experimental research in the British Isles and the Scandinavian countries is now on a higher level than that in the rest of Europe. Nowhere, however, is such a vast amount of work being carried out as in our own universities and large clinics. A brief sojourn of a week or ten days in each clinic is to be preferred to a longer stay in any single place. This is particularly true if the traveller has had sufficient postgraduate training or experience to be able to evaluate the differences in methods and personalities of the various men visited.

Although the keen observer will note much of value to him he will also disapprove of many procedures as he sees them carried out abroad. He should, however, refrain from too critical comparisons. He will come to appreciate, I am sure, our own advanced status in equipment, methods and asepsis, and will realize how valuable and important it is to be free from the political interference that the medical profession is forced to endure throughout most of Europe.

INDICATIONS FOR CESAREAN SECTION*

RUSSELL J. MOE, M.D.
Duluth, Minnesota

DUE to perfection of surgical technic during the past few decades there has developed a false sense of security in the cesarean section operation. The indications have been widened to keep pace with this progress in surgical development to the point where almost any obstetrical complication which is not readily corrected becomes in some parts of the country an indication for an abdominal section. Williams and Stander, as well as many other writers, are of the opinion that there are too many cesarean sections performed for insufficient indications. An operation which carries a mortality of 4.1 per cent, as shown by Lynch in a recent survey, must be given due consideration and rigid limitations. The fact that the mortality in the hands of experts is as low as any abdominal operation does not justify the operation without a very definite indication.

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The indications for cesarean section are considered as absolute or relative. The absolute indication is one in which a living fetus cannot be delivered through the birth canal, while the relative indication is one in which the fetus may be delivered through the birth canal, but its chances of survival, as well as that of its mother, are increased when cesarean section is performed.

Disproportion

A contracted or a deformed pelvis, in which either the inlet or the outlet is so small as to prevent the delivery through the birth canal, is an absolute indication for cesarean section. There is much variation in the size of pelves, as well as in the size of passengers, and therefore one must exercise judgment in determining whether or not delivery is possible through the birth canal. A patient with a justo minor pelvis and a large baby may be a candidate for a section, while it is probable that a small baby would deliver normally through the same pelvis. The simple process of determining the pelvic measurements and the size of the fetal head will usually indicate whether or not cesarean section is necessary. The cases of disproportion in which the indication is not definite should all have a real test of labor before abdominal delivery is decided upon.

Hemorrhagic States

This group of indications is composed of conditions in which the blood loss may be great, thereby increasing the hazard for both mother and child. They are usually emergency conditions and demand immediate treatment. Placenta previa is an indication when the hemorrhage is severe and the condition of the cervix is such that the bleeding cannot be readily controlled or the delivery completed rapidly from below. Various groups of statistics show conclusively that the maternal and fetal mortality are reduced when cases of placenta previa with severe hemorrhage and undilated cervix are treated by cesarean section. Placenta previa, abruptio placentæ or a ruptured uterus may bleed so severely as to indicate abdominal delivery in spite of the fact that the fetus is dead. The latter two conditions also sometimes require the removal of the uterus.

Obstructing Lesions

Among the obstructions to the birth canal which may indicate an operative delivery through the abdomen are fibroids in the lower uterine segment, ovarian cysts or dermoids, previous surgical procedures, carcinoma of the cervix, rigid cervix and acute edema of the vulva. One is often surprised, however, at the change in the position of a fibroid during the first stage of labor as the lower uterine segment is pulled upward over the presenting part. Previous surgical procedures, such as high amputation of the cervix and certain fixation operations of the uterus, may contraindicate normal delivery. In elderly nullipara one occasionally encounters a rigid cervix which will not thin out or dilate readily. While there is much difference of opinion as to the procedure to be followed, most obstetricians are agreed that a test of labor should be allowed and continued as long as there are no indications of maternal or fetal distress. Many of these patients will deliver normally if given a chance. Mengert reports that in nine and a half years' experience at the University of Iowa there was not a single instance in which rigid cervix was given as an indication for cesarean section. It is important in these cases to conduct the labor in such a manner that an abdominal hysterotomy does not become contraindicated.

Previous Distocia

A patient with a history of two or three previous difficult labors, ending in death of the fetus, may well be a candidate for cesarean section, and it is best performed at the time of election. The x-ray study of the bony pelvis may be expected to give more information in some of these cases in the future.

Previous Cesarean Sections

"Once a cesarean always a cesarean" is not true unless the operation has been performed for an absolute indication. The previous indication may not be present during a subsequent pregnancy. If the puerperium following the section was afebrile, and there is every reason to believe there was good healing of the uterine wound, the patient may be allowed to go into labor, but should be watched closely in a hospital and immediate operation carried out if weakness or rupture of the uterine scar becomes apparent. However, elderly nulliparas, in whom previous myomectomies have been performed, should not be allowed to go into labor. They are more apt to have a ruptured uterus than a patient with a previous section.

Malpositions

Abnormal positions of the fetus or the presenting part occasionally indicate interference in the way of abdominal delivery. Transverse positions, brow and face presentations, often cause a difficult prolonged labor, with considerable danger to the child. Each case must be judged on its own merits, but fundamental knowledge and skill in obstetrical procedures will overcome or correct many of these malpositions without resorting to radical operative measures.

Medical Complications

Heart disease and tuberculosis are very rarely justifiable indications for cesarean section. Proper treatment, with the assistance of a competent internist, during the pregnancy, is of primary importance. Forceps delivery, as soon as dilatation is complete, will conserve the patient's energy by avoiding the expulsive effort during the second stage of labor.

Before the use of insulin it was common knowledge that the fertility of diabetic women was low. At the present time, however, we are seeing more diabetic mothers going through pregnancy, and it has presented a problem which is not yet generally recognized. Diabetic mothers are known to have a high fetal death rate. The babies are practically always much overweight, predisposing to a difficult and prolonged labor, during which they often succumb. Priscilla White, Randall and Rynearson recommend the premature delivery of the infant of the diabetic mother by cesarean section during the thirty-sixth or thirty-seventh week of pregnancy. The immediate care of the infant is also very important, to prevent postpartum death from hypoglycemia.

Rarely severe nervous disorders may be considered as indications for abdominal section, especially where the labor may place an undue strain upon the mother.

Toxemia

Eclampsia is not an indication for cesarean section. Eclamptic patients do not tolerate shock, and statistics have proven repeatedly that better results are obtained by conservative measures. Non-convulsive toxemias which do not respond to known measures of treatment and are fulminating in character may be considered as proper indications, and are best performed under local anesthesia.

The accompanying table is a résumé of the indications for cesarean section performed in St. Luke's and St. Mary's Hospitals in Duluth during the seven-year period from 1931 to 1937 inclusive.

TABLE I

	Number	Per cent
Number of hospital deliveries	8,736	
Number of cesarean sections	95	1.08
*Mortality following cesarean sections	1	1.05
Indications		
1. Disproportion		
Contracted pelves	22	23.1
2. Hemorrhagic States		
Placenta previa	13	13.65
Abruptio placentæ	7	7.35
Ruptured uterus	2	2.1
3. Previous Section	13	13.65
4. Previous Dystocia	10	10.5
5. Toxemia	8	8.4
6. Obstructing Lesions		
Tumors	4	4.2
Elderly nullipara	2	2.1
Previous high cervical amputation	1	1.05
Acute edema of vulva	1	1.05
7. Malpositions		
Transverse	3	3.15
Brow	1	1.05
Face	1	1.05
8. Dystocia	3	3.15
9. Medical Complications		
Heart disease	3	3.15
Severe Parkinsonian	1	1.05

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*The one death was due to a ruptured uterus following soon after operation.

Conclusions

1. A plea is made for more conservatism and more definite and rigid indications for the performance of cesarean section.

2. It is important to conduct a labor in such a manner that an abdominal operation does not become contraindicated.

3. Sins of omission are still adding to the maternal and infant mortality in the treatment of placenta previa and diabetes.

4. A fundamental knowledge of obstetrics and skill in obstetrical management will obviate many of the questionable indications for cesarean section.

5. A brief résumé of the indications for

cesarean section performed in Duluth for a seven-year period is presented.

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PROGESTERONE IN THE TREATMENT OF HABITUAL ABORTION*

S. B. PETERS, M.D.

Silver Creek, New York†

THE use of progesterone or corpus luteum containing extracts in the treatment of habitual abortion has a definite experimental foundation. It is too true, we all must agree, that the theoretical concepts of gynecologic endocrinology, when applied clinically, have proved very disappointing. There have been many optimistic claims advanced as to the values of hormones in the treatment of numerous disorders of the female genital tract, but few have met the test of clinical application. Many or most of them have failed dismally. However, in the past few years there have been certain and definite advances in the field that even the more conservative gynecologists are coming to recognize.

We have but to review the work of Corner[3] and of Corner and Allen[4] at the University of Rochester to become convinced of the necessity of the presence of corpus luteum extracts or the chemically pure hormone itself to maintain pregnancy in the rabbit. In the human being the corpus luteum of the ovary remains active until the fourth month of gestation, when it begins to degenerate slowly, until about the sixth or seventh month, when usually there remains little or no evidence of its presence. We know that the ovary containing the corpus luteum of pregnancy may be removed after the fourth month of pregnancy with only a small chance of abortion or premature labor following. It is thought that the placenta takes over the manufacture during the remainder of the pregnancy.

We are indebted to the work of Fraenckel[8] in 1903, for the foundation of an important series of advances. He demonstrated that the removal of the corpus luteum of the rabbit resulted in absorption or premature expulsion of the fetus. Allen and Corner[1] conclusively proved that progesterone is necessary for the conservation of early pregnancy. Knaus[10] and Manzi[12] showed that progestin maintains the uterus in a state of quiescence during pregnancy and that the uterus becomes sensitive to preparations of the posterior lobe of the pituitary when the influence of the corpus lutem declines. Hisaw[7] demonstrated the ability of progestin to nullify the effect of posterior pituitary extract. Estrogenic substance, on the other hand, sensitizes the uterus to the oxytocic principle of the pituitary, thus stimulating uterine contractions. Abortions have been produced in animals with excessive doses of estrogenic material. The method by which the estrogenic substance sensitizes the uterus to the oxytocic principle of the posterior lobe of the hypophysis is not clear. It is debatable whether it stimulates an increased production of the hormone.

Pratt[13] has shown that there is less than one international unit of progesterone in 40 grams of human corpus luteum and Bloch[2] has shown that there is less than one unit in each of eight and twelve liters of sow's blood. These observations are interpreted to mean that production, utilization, and excretion are continuous and that there is little storage. More recently Venning and Browne,[14] et al, at McGill, have formulated a method for quantitative determination of a substance, pregnandiol-glucuronidate, in human urine. Measurements of the excretion of this substance have been made during the normal menstrual cycle and throughout pregnancy. This product is considered to be an excretion product of progesterone. They find from a short series of normal menstruating women that this product, pregnandiol-glucuronidate, is not excreted during the follicular phase of the cycle (the first fourteen days of a twenty-eight day cycle), but only in the luteal phase of the cycle. The time of onset of menstruation in their cases bears a definite relationship to the disappearance of this substance from the urine. That time is consistently two or three days. The presence of this substance does then correspond to the activity of the corpus luteum and further substantiates Pratt's conclusion that production, utilization and excretion are continuous.

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†The author formerly lived in Virginia, Minnesota.

Venning and Brown[14] further find that during pregnancy the urinary output of pregnandiol-glucuronidate shows a definite increase usually beginning in the third or early in the fourth month and this output continues to rise from then until the eighth or ninth month. Within twenty-four hours of delivery the compound disappears practically completely from the urine. Patients who have a tendency to abort have a lower output than in the cases of normal pregnancy studied. These observations are certainly in accordance with the principles set forth heretofore that this substance, pregnandiol-glucuronidate, is an excretion product of corpus luteum, that its precursor, the hormone corpus luteum, is not stored, that its production and utilization is parallel and equal, and that its lack would produce spontaneous abortion or premature labor. Substitutional therapy with the corpus luteum hormone or chemically pure progesterone should then seem indicated in cases of habitual abortion.

I have had occasion in the past year to treat four cases of recurrent spontaneous abortion and carry them to term with delivery of normal living infants. I will report these cases. The general method of treatment followed was the biweekly intramuscular injection of progesterone or corpus luteum extracts amounting to approximately one international unit, as soon as the diagnosis of pregnancy was made and up to and including the fifth month of pregnancy. There was one exception to this procedure which will be discussed in turn. In all cases the blood Wassermann reactions were negative and nothing in the history, physical examination or laboratory data could be found to account for the abortions.

Case No. 1.—A thirty-nine year old para 1, gravida 4, whose first pregnancy terminated in a full term low forceps delivery of an 8½ pound living normal male. The second pregnancy terminated spontaneously near the end of the third month, as did the third pregnancy. The last menstrual period was March 6 and estimated date of confinement was December 13. This pregnancy, as were her previous pregnancies, was characterized by severe nausea and vomiting in the early months. The general physical examination was entirely negative, as were the laboratory examinations of the blood and urine. The blood Wassermann was negative. The patient was first seen when eight weeks pregnant. Three-tenths grain of the soluble extract of corpus luteum was given intramuscularly for the next three days with very marked improvement in the nausea and vomiting and the same dosage was given twice weekly for the subsequent eight weeks. The remainder of the prenatal period was uneventful, and the patient was delivered of an 8.5 pound living normal female infant, also by low forceps.

Case No. 2.—A thirty-three year old para 1, gravida 5, whose first pregnancy terminated in a full term normal delivery in 1931. Her next three, pregnancies terminated at four, three and three months respectively, by spontaneous abortions. The last menstrual period was July 27, 1937, and the estimated date of confinement was May 4, 1938. This patient, like the first patient, complained of severe nausea and vomiting in the early months. There were also associated flashes and severe headaches. Two years previously she had undergone an operation for an ovarian cystadenoma and the left ovary was said to have been removed. Her previous menstrual history was normal. The general physical examination was essentially negative except for a well healed midline suprapubic operative scar. The blood and urine studies, as was the blood Wassermann, were negative. The patient was first seen when she was seven weeks pregnant and one international unit of progesterone was given intramuscularly and repeated every other day for three doses. Then the same amount was given biweekly over a period of ten weeks, which corresponded to her fourteenth week of pregnancy. This patient also responded quite spectacularly in regard to the disappearance of her nausea and vomiting and associated symptoms. These difficulties were cleared up almost entirely after the third injection. The remainder of her pregnancy was uneventful, and she was delivered of a 7.5 pound normal female infant, May 1, 1938.

Case No. 3.—A twenty-three year old para 0, gravida 3, whose first pregnancy terminated at the end of the third month at the time she would have menstruated normally. Her second pregnancy terminated spontaneously two years ago at the end of the third month, also when she would have normally menstruated. The last menstrual period for her third pregnancy was July 22, her expected date of confinement was April 29. I first saw her on a home call, at which time she complained of spotting. This was about nine weeks after her last menstrual period. She was placed on bed rest and given one international unit of progesterone for two successive days. She was then given the same dose two times weekly for the next six weeks. Her previous menstrual history was normal. Her general physical examination was negative, as were the blood and urine studies. The remainder of the pregnancy was uneventful with exception of the development of varicose veins in the legs, which were injected and responded well to treatment. She was delivered of a normal female infant on April 25, 1938.

Case No. 4.—A twenty-three year old para 0, gravida 4, whose first pregnancy terminated at five months in premature labor with a stillborn infant; second pregnancy terminated at seven months with premature labor and a stillborn infant; third pregnancy terminated at six months with premature labor and a stillborn infant. There was nothing in her history to suggest diabetes, lues or hypothyroidism. The blood Wassermann had been negative on three previous occasions. Her previous menstrual history was regular and normal. Her last menstrual period was October 18, and her estimated date of confinement was July 25. Her general health appeared excellent. The general physical examination was essentially negative, as were the blood and urine studies. Basal metabolic rate done when first seen at 6 weeks following her last period was plus 5 per cent. The blood Wassermann was negative. Progesterone, one international unit, was given intramuscularly every two weeks from the eighth week to the fourteenth week, then once weekly from the fourteenth to the 36th week. Iron medication, high vitamin diet and general hygienic measures were instituted early in pregnancy and maintained throughout.

The entire prenatal period was uneventful and the patient had a spontaneous labor and was delivered of a normal living 7.5 pound female infant July 24, one day from the estimated date.

Other cases in the literature are as follows: Krohn, Falls and Lackner[11] reported eight cases of habitual abortion in a series with threatened abortion in which was given 1 international unit of progesterone weekly up through the thirty-second week and each was terminated successfully at term. Kane[9] reported forty cases; ten had one living child each and then had aborted one to three pregnancies subsequently; twenty had had one previous abortion, fourteen had had two, four had had three, one had had four, and one had had six previous abortions. Out of this group there were but four failures; one pregnancy ended at six months. In another a two-month fetus was expelled after five months of pregnancy and there was one abortion at two months and one at three months. Prolution (Schering) was used in his patients as follows: 1/25 international unit was given every other day for ten doses. This was repeated at three-week intervals up to the thirty-second week. His patients received at the most just two international units of the hormone. In addition each patient received one-half grain of desiccated thyroid three times daily for four weeks and four grains of sodium iodide three times daily for two weeks following the thyroid medication. All medication was stopped at six months. In his series of forty, Kane noted a definite increase in fetal abnormalities. Elden[5] reported a series of eight cases in which treatment was carried over a period of six lunar months and from ten to forty-four international units progesterone were used. Six of his cases were successful; two were failures. Of the six successes five had had at least three to five abortions and had carried none to term. One had had one living child, her first pregnancy, and three subsequent abortions. One failure was attributed to a Dudley operation on the cervix and occurred at the end of the fourth month, and the other had terminated in a premature labor at seven months, treatment having been stopped three months previously.

The causes of habitual abortion are many and varied. The lack of the hormone produced by the corpus luteum is but one—chemic systemic disease, syphilis, nephritis, hypovitaminosis, hypothyroidism, defective decidual reaction and fetal malformation being a few of the other causes.

It is reasonable to suppose that abortion would have occurred in some of the patients reported above if treatment had not been instituted. The dosage at present is empirical. Kane used but two international units over a period of thirty-two weeks. Others have used almost as much as fifty international units. Elden and Wilson[6] have shown that very minute amounts can be used to control dysmenorrhea in selected cases. It is probable that much smaller doses than we used may prove efficacious.

As to the period of medication it would seem logical, in view of Venning and Brown's very excellent work on the output of pregnandiol-glucuronidate to treat these patients until the eighth month, especially if a history of premature labor exists.

No definite conclusions can be stated from so small a series of cases, even including those reported in the literature, but the speculation can be made that in progesterone we have a specific for a certain type of quite common recurrent abortion and premature labor, a view which is corroborated by experimental studies.

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HUMAN HEREDITARY DEFECTS*

E. J. ENGBERG, M.D.

Faribault, Minnesota

By heredity is meant the transmission to individuals of various specific, desirable or undesirable, physical and mental qualities present in parents or more remote ancestors.

It is important to know what conditions appearing to be inherited are truly so, because many earlier ideas were wrong. We now know that syphilis and tuberculosis are not inherited, but are the result of direct infection. Congenital syphilis is the result of infection and not of inheritance even if the effects of the disease are evident at birth.

Harmful effects in the environment may impair the individual's efficiency, and, if sufficiently severe, result in sickness, while the harmful effects of inherited forces result in defects. These defects are numerous and many physicians have not fully recognized the important rôle played by inheritance in causing disabilities or freedom from them in man.

It is surprising that before the knowledge of fertilization, the fundamental laws of inheritance were discovered by experiments conducted and analyzed by Gregor Mendel. His work was published in 1866, but no one grasped its tremendous importance until in 1900, when three botanists working independently demonstrated that his basic laws of heredity are active through the entire plant and animal kingdoms. The first human case was that of a hereditary shortening of fingers and toes, reported in 1905.[2]

Mendel worked with various types of garden peas, but it is easier to cite an experiment in animal life as described by Dr. Otto L. Mohr,[2] Professor of Medicine, at the Royal Fredericks University, Oslo, in his book, "Heredity and Disease." From this book the author, with the kind consent of the publishers, W. W. Norton and Company, Inc., has been permitted to use material for this paper. If we breed a pure-bred black rabbit with a pure-bred white, all the offspring in the first generation will be black. If we breed these black rabbits together, however, we obtain in the next generation both black and white rabbits and these in a fixed ratio of three black and one white. Furthermore, when these white rabbits are bred together, all their offspring are white, but the black if bred together act differently, as one of them is pure-bred black and by inbreeding gives black only, while the other two black are hybrid and by inbreeding give black and white offspring, and again in the ratio of three black and one white. Furthermore, if the hybrid blacks are bred with their white brothers or sisters, they yield equal numbers of white and black.

The explanation for the color present in the various rabbits in the experiment is that each rabbit carries two genes for color. In the pure black, both are for black coloring, while in the

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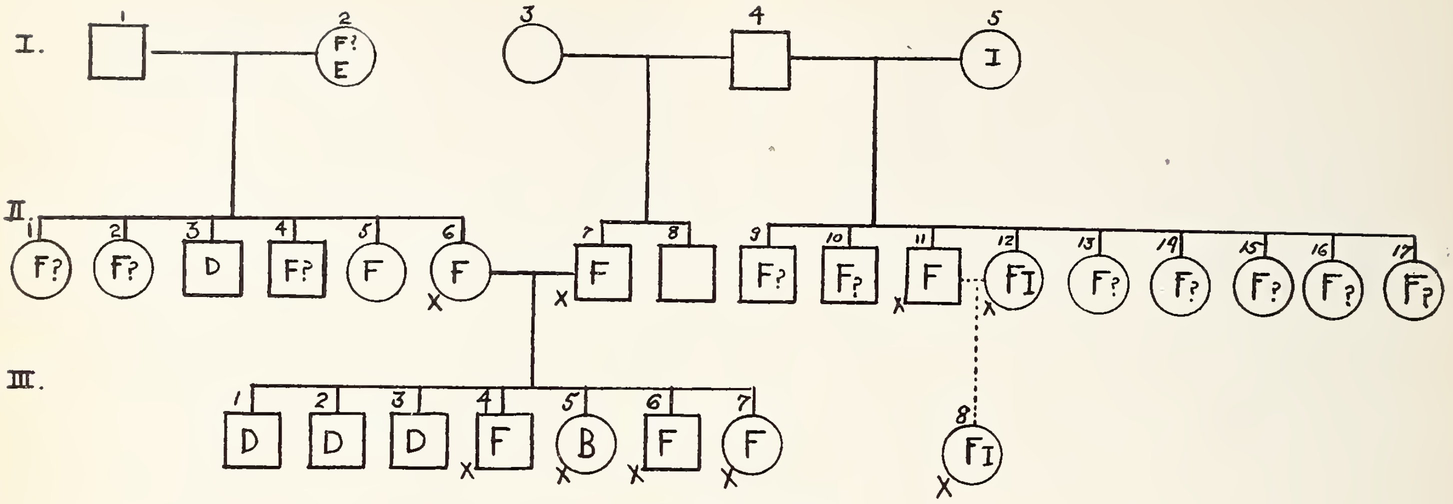
CHART I. THE "B" FAMILY



Prepared in 1933

Explanation of Chart

I, II, III, Generation. Symbols: Male ☐ Female ○

Connecting horizontal line indicates marriage. Vertical descending line indicates offspring.

F—Feeble-minded (Followed by (?) indicates no test, but described as mentally defective.)
B—Borderline
E—Epileptic
I—Insane
X—At some time in the State School for Feeble-Minded.
D—Died in infancy

GENERATION I

1. The maternal grandfather was born about 1839 and was said to be feeble-minded.
2. His wife was described as both feeble-minded and epileptic.
3. The first wife of the paternal grandfather died of brain fever at age thirty-three.
4. The paternal grandfather is described in one record as "mentally fair."
5. The second wife was committed to the Fergus Falls State Hospital in 1887, but must have been released in a short time, as her next child was born in 1888. There is a question of feeble-mindedness here rather than insanity as she is described as "mentally inactive."

GENERATION II

1, 2, and 4 are described as feeble-minded.

3 died at the age of three.

5 is described as an epileptic half-sister so probably there was another mating in the first generation, although there is no information.

6, the mother of the third family, was born in 1875, married in 1903, and had an Intelligence Quotient of 53, which was determined while she was at the School from 1912 to 1915.

7, the father of the third family, was also institutionalized from November, 1912, to November, 1914. He had a mental age of 9 1/5 years in 1912, the I.Q. not being recorded. His birth date was about 1871.

8 has been a farmer all of his life, and has never been tested.

9, 10, 13, 14, 15, 16, 17 have never been committed as feeble-minded, but are declared to be defective in varying degrees.

11 was committed in 1929 and then admitted to the School where he now is. His I.Q. is 55, and he is the father of an illegitimate girl by his sister.

12 was also committed and is now in the institution, I.Q. 47. She is the mother of the girl (Generation III, No. 8) by her brother.

GENERATION III

1, 2, and 3 died in infancy.

4, I.Q. 47, first admitted in 1910. He has been paroled several times, sterilized, and finally readmitted for an indefinite stay.

5 admitted in 1912, and received the training of the School Department. She was paroled in 1924 on account of a borderline test of 84. She maintains herself with help and supervision.

6 tests 71. He has been at Red Wing Training School, and then in the institution for short intervals. After sterilization, he has supported himself partially by manual work and playing the piano for country dances.

7 tests 53, first admitted in 1912, was sterilized, tried on parole, failed to adjust, and is now in the institution.

8, the offspring of the brother and sister mating, was admitted in 1929. Her I.Q. is 38. This girl and her mother have shown a mental deterioration actually amounting to dementia præcox since institutionalization.

Note.—Only the members of the family about whom there is some description in the records at the School are included in the chart. No research has been done in the community where there are many more members who have married and reproduced.

pure white both are for the lack of color or albino state. In the hybrid blacks each has received one gene for black and one for white color, but the black gene being dominant renders the white or recessive gene inactive. The recessive (white) gene can cause the white color only when a mature egg carrying one recessive unit in fertilization combines with another mature germ cell also carrying that particular recessive gene. Therefore, only pure white bred with pure white results constantly in white offspring, as then only recessive genes for color are present in each parent. In the pure black rabbit both genes for color are for black, while in hybrid blacks one gene is for the dominant color black and one for the recessive color white. The inbreeding of the hybrid blacks results in the following combinations of genes: black-black 25 per cent, black-white 50 per cent, white-white 25 per cent. The first 25 per cent carry the gene for black color in two units so that the offspring are pure-bred black, 50 per cent carry one unit for black and one for white, and, as the black gene is dominant, result in these offspring being hybrid black; while 25 per cent carry both genes for white color, resulting in white offspring. Accordingly, an individual may carry a particular gene in double or single dose as determined by the particular inheritance. The germ cells of each parent, however, are genetically pure and will contain any given gene present in the parent in single unit only, uninfluenced by the combination of genes that were present in the parent.

The same rule of inheritance applies with reference to the color of eyes in man. Brown is dominant, blue is recessive, and brown-eyed or blue-eyed individuals are born according to the Mendel formula of inheritance.

The illustrations cited thus far have to do with the transmission to offspring of inherited qualities carried in the genes of the parent germ cells having to do only with color determination. However, all of the various genes present in a given germ cell each carry a specific quality that may be desirable or extremely valuable, or that may be undesirable or even devastating in its effect. These all exert their influence in accordance with biological laws of inheritance in determining the physical and mental characteristics of the offspring, except as they are influenced by environmental factors. A dominant case of defect in man reported by Dr. Mohr[2] is that of finger shortening affecting only the second phalanx of the second fingers and toes in which the dominant inheritance was traced back six generations to a Norwegian woman born in 1764. Of her ten living and seven stillborn children, the family record stated: "Every second child had, as she has herself, a shortened crooked forefinger with one joint only."

Consanguinous marriages favor the appearance in offspring of recessive traits and the defect may not have been apparent for several generations. The data on albinism is very extensive and illustrates this tendency well, as extensive studies have been made showing consanguinity in the production of albinotic children in 50 per cent of one series and 33 per cent in another. Theoretically, such a mating will result in 25 per cent being albinotic, but in human families with a small average number of children, many instances will show no affected children in spite of the theoretical three and one ratio.

Certain inheritance defects are sex-linked. An example of this in man is that of color blindness, in which case vision is normal but the individual cannot distinguish between the colors red and green. Although we shall not discuss the scientific facts in the transmission of this defect, extensive studies show a frequency of 8 per cent color-blind men and 0.5 per cent of color-blind women in the general population. Hemophilia is another sex-linked defect. No established cases of hemophilia in women are known.

Hereditary defects in the organs of special sense are very striking. Hereditary deafness is due to recessive genes; and even the deafness in later life due to otosclerosis seems in a number of cases to be best explained by the presence of a recessive gene carrying this defect. Some of the most striking and most destructive inherited defects are those affecting the eye. Congenital night blindness is one of the best examples of dominant inheritance. Mohr cites one French family in which this defect has been present through ten generations. Of more serious eye lesions are certain cases of glaucoma which may be dominant or recessive sex-linked; a large number of hereditary cases of cataract, mostly dominant but very different in types and in time of onset; and also cases of retinitis pigmentosa.

It is generally agreed that about 50 per cent of the mentally defective are so because of inherited defect. Mongolism is not. Goddard[1] concluded from his extensive studies that normal-mindedness as opposed to feeble-mindedness behaves like a dominant unit character and is transmitted in accordance with Mendel's law. Therefore, when both parents are feeble-minded, there is a distinct tendency for all of their children to be feeble-minded. Investigators have concluded that infantile amaurotic idiocy is due to the effect of a single sublethal recessive gene.

In our institution for mental defectives at Faribault some interesting inheritance studies have been made. Dr. A. C. Rogers, while superintendent, showed this in his very interesting publication "Dwellers in the Vale of Siddem." A chart prepared for the Children's Bureau of the Board of Control in February, 1937, shows the social burden resulting from the intermarriage of the families which are, for the purpose of study, known as "Callerquist" and "Larkeson." As a result of this union, sixteen descendants have been in our institution. Another study made by Miss Caroline Perkins of our Social Service Department of the "B" family (Chart I) showed the same resulting social burden with the particularly interesting fact that, as a result of the union of two feeble-minded individuals, three children were dead and their mental state undetermined, while the other four children and the parents were inmates of our institution. Dr. A. R. T. Wylie, of our medical staff, kindly prepared for use in this paper a list of families with several members now in our institution. In one instance, we have eleven members and have had sixteen; in another instance, fourteen; and in five instances, four members of each family are still in the institution. One of these families consists of the father, mother, and two children. In another case, we have had four and still have two remaining. The other two have died in the institution. In still another case we have five of the same family; and in two instances, six of the same family. Finally, we have one family of eight, including father, mother, two sons and four daughters.

The exact status of inheritance in the psychoses is not clear except that one considers, as do the English particularly, that the defect is one which may show varying psychoneurotic states such as psychoses, feeble-mindedness, epilepsy, migraine, et cetera. However, inheritance has been shown to be of a great deal of importance in the etiology of manic-depressive psychoses and schizophrenia. Of all the types of psychoses studied, the manic-depressive have shown the greatest frequency of hereditary taint, and this predominately with psychoses.

In the field of neurology, many hereditary diseases are found, such as different hereditary types of muscular dystrophy, Fredreich's ataxia, Huntington's chorea, which is typically dominant; Wilson's disease, in which the brain and liver are involved and which defect is of recessive type; and idiopathic epilepsy, which stands on a definite hereditary recessive basis. Mohr[2] refers to one study of Quincke's angioneurotic edema, in which it appeared as a clear-cut dominant inheritance through five generations, resulting fatally in fifteen of twenty-eight affected family members.

Diabetes mellitus seems to be inherited as a recessive defect, while diabetes insipidus is a clear-cut dominant defect when inherited, and then is due presumably to hereditary dysfunction of the pituitary gland.

The hereditary mechanism of tumor susceptibility has not been demonstrated with any degree of certainty. The somatic mutation theory has been advanced but has not been generally accepted.

Lethal genes may occur through mutation and this may be a sudden, spontaneous alteration in the character of a gene, and this altered character being transmitted thereafter. Ichthyosis congenita in the human is explained on this same basis. This fact resulted in the following unusual occurrence reported by Dr. Mohr.[2] A normal woman gave birth to five normal children by her husband. After his death she had three illegitimate children, all stillborn, having this condition of ichthyosis. Investigation showed that the father of these, though she did not know it, was her own half brother by the same father.

The results of x-ray treatment of eggs and larvæ show some interesting and striking effects, as mutation is increased tremendously, and these changes frequently are like those of spontaneous origin.

Some of the most interesting studies on inheritance have been in the comparisons between various pathological conditions occurring in identical as compared with fraternal twins. These studies made in regard to criminalism suggest that weakness of character may be due to an inherited defect. Dr. D. E. McBroom and Dr. R. W. Brown a few years ago reported at a meeting of the State Neurological Society many interesting observations in connection with a pair of identical twins suffering from epilepsy. Another interesting example of recent observations made in the study of identical and fraternal twins is that susceptibility or resistance to certain diseases may be a transmitted hereditary quality. Thus Dr. Mohr[2] reports in a series of thirty-seven pairs of identical twins that both twins had developed tuberculosis in twenty-six pairs, and only one of the twins in eleven pairs, while in sixty-nine pairs of fraternal twins, tuberculosis was present in seventeen pairs and not present in fifty-two pairs. Among nine pairs where the twins were subject to the same amount of exposure and only one twin became affected, eight pairs were fraternal and one pair identical twins. Conversely, among seven pairs in which both members were affected without known exposure, five pair were identical and two pair fraternal twins. In some of these cases the clinical type was surprisingly similar, such as one in which two identical twin brothers within a four-year period each developed a tuberculous involvement of the bone of the heel. It appears, therefore, that some of the unexpected occurrences in tuberculosis may be due to an inherited resistance or lack of it to the tubercle bacillus.

It is evident that much remains to be learned in regard to the transmission of hereditary traits in man, be they defects or superior qualities. It is apparent, also, that in all of our state institutions a great number of inmates are there, primarily, because of defective germ plasm.

For humanitarian reasons and to reduce the social and economic burden resulting from the presence of various serious defects in man, it should be the desire of society to render prevention in this field as effective as is reasonably possible, although the problem is very complex, and presents vastly greater difficulties than it does in most other fields of medicine.

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MUMPS MENINGO-ENCEPHALITIS*

T. L. BIRNBERG, M.D.

Saint Paul, Minnesota

IN recent years, increasing attention has been focused on the meningeal and meningo-encephalitis symptoms occurring in various infectious diseases. Four years ago I reported a series of nine cases of mumps meningo-encephalitis seen during the prior eighteen months.[2] At that time we felt that this complication was of probable cyclic occurrence, appearing only during intermittent intervals in the life cycle of the mumps virus; further, prior reports suggested that this neurotropic tendency of the mumps virus occurred about every tenth year.

Since then, namely, in the past four years, we have observed twenty-nine additional cases of mumps meningo-encephalitis in private practice. So large an incidence in a period of five and one-half years, with no coincidental unusual mumps epidemic, leads us to consider mumps as a disease in which meningeal symptoms appear relatively often, and in the preadolescent age group it has been the most frequent complication we have observed.

The various neurological complications of mumps as noted in the literature include meningitis, meningo-encephalitis, encephalitis, myelitis, and neuritis. As previously mentioned, prior literature has suggested that these complications occur in only some of the epidemics of parotitis, whereas other epidemics are entirely benign in respect to any neurological manifestations. The earliest recorded description of mumps meningitis was that of Hamilton[9] in 1758. During the 19th century descriptions of this complication were recorded by a number of French,[4,5,14,21] German,[6,17] and Norwegian[10,11] authors. In 1902,

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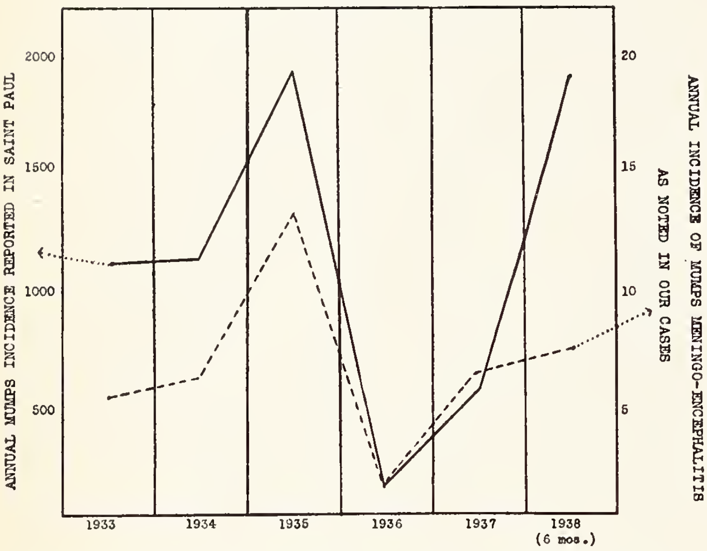
Monod,[15] reported the first spinal fluid examination made in mumps meningitis.

In 1913, Acker[1] reported two cases of mumps meningitis and collected reports of twenty-seven cases occurring in children, in the literature prior to that time. Subsequent reports are all of relatively small groups of cases; the largest is a group of twenty cases in adults, reported by Silwer[19] in 1936. However, since the disease is rarely fatal and is often very benign symptomatically, many cases have no doubt failed recognition.

CHART I. COMPARISON OF ANNUAL NUMBER OF CASES OF MUMPS MENINGO-ENCEPHALITIS NOTED IN THIS SERIES TO ANNUAL MUMPS INCIDENCE REPORTED IN SAINT PAUL



In an effort to evaluate the comparative incidence of central nervous system symptoms in mumps, we find the literature at great variance and rather misleading. Since mumps cases are commonly never reported, and since in general mumps meningitis is not a reportable disease as such, mass statistics cannot be determined. In individual reports, the author's awareness of the occurrence of such complications is of much significance. Haden[8] found nine cases in 840 mumps patients; Wesselhoeft,[26] two cases in 824 hospitalized mumps patients and Roux[18] three cases in 274 cases of mumps. Larkin,[12] in 1918, found two patients with meningeal symptoms in 2,400 cases of mumps in a training camp. These are all reports of adult groups, and Larkin's figures perhaps give the most accurate index of neurological complications in young adults, but is of too small a group to be significant. Undoubtedly, the most valuable statistics might be compiled from incidence records in orphanages over a long period of years, but no such reports appear in the literature.

The quarantine data in Saint Paul suggests some interesting points as regards the yearly incidence of mumps and mumps meningitis. The City Health Department estimates that about 60 per cent of the cases of epidemic parotitis are reported, largely through school absence checkups. Mumps meningitis is not reportable as such and thus no city-wide statistics of this complication could be obtained. Chart I shows the annual number of reported cases of mumps. The number of cases of mumps meningo-encephalitis seen by us during this same period is also charted for comparison. While our observations include but a small part of the total mumps incidence, the fairly regular parallelism of the two lines suggests that in recent years at least, meningo-encephalitis is a rather constant complication of mumps, rather than of cyclic occurrence as previously observed.

The cases we are discussing are best described as meningo-encephalitis. Although meningeal or encephalitic symptoms may variably predominate, clinically it would appear neither advantageous nor always possible to accurately differentiate the essential localization.

The specific cause of mumps meningo-encephalitis would seem to be either the mumps virus per se or a toxin liberated by the virus. The most decisive work was done by Wollstein.[25] In her experiments she used pooled, filtered mouth washings of mumps patients. The filtrate was injected into cats subcutaneously, into the parotids, and intrathecally, the latter method producing symptoms of meningitis. With the spinal fluid from cats so affected, she was able to produce the disease in other cats. Control tests with filtered saliva from normal humans gave negative results. Gordon[7] in 1913 produced encephalitis in monkeys by intraspinal injections of mumps saliva filtrates. From the case of mumps myelitis reported by McKraig and Woltman,[13] cultures taken from Steno's duct were injected into rabbits with resultant paralysis in eight hours in one case. All these experiments indicate that the virus itself is the causative agent of the meningitis; further, the clinical observance of neurological symptoms before the glandular localization in some cases would tend to negate the virus toxin theory. Whether the virus spreads from the parotid to the meninges directly through the naso-pharynx or through the blood stream is as yet undetermined. One other etiologic approach has recently received consideration. The increase of the various encephalitides in the past two decades is too great to be explained as due to more accurate diagnosis. It would seem possible and plausible that the encephalitis may result either from some symbiotic reaction between the mumps virus and a latent encephalitis virus commonly present in the naso-pharynx, or from activation of such a latent virus during a period of local or generally lowered resistance. True, these are theoretical suggestions, but are mentioned since they may aid in ultimately understanding the entire encephalitis problem.

Since mumps meningo-encephalitis is rarely fatal, pathological reports are few. From the reports of Larkin[12] and Gordon,[7] it appears that there is a congestion of the pia with patchy lymphocytic infiltration along the cerebral blood vessels.

The symptomatology of mumps meningitis is not characteristically distinctive, yet our cases showed a fair degree of similarity. Males are attacked more than females, in our series a ratio of 78 to 22 per cent. While this report includes only children, no age group susceptible to mumps seems immune (Table I).

TABLE I. SUMMARY OF CASES

Total number of cases observed in 5½ years: 38
Sex: Male—29 cases (78%)
Female—9 cases (22%)
Age: Varied from 4 to 14 years (average 8 years)
Onset in relation to onset of parotitis:
Generally 1 to 10 days after onset of parotitis
Definite parotitis never present in 2 cases
Duration: 3 to 11 days (average 6 days)
Sequelæ: One patient had recurrent headaches for 3 months. Subsequently entirely well.
One patient had residual central deafness of left ear.

The clinical symptoms of mumps meningo-encephalitis may appear at quite varying intervals after the onset of the parotitis. The great majority of cases occur in from one to ten days after the appearance of the parotid swelling. Occasionally the meningitis and parotitis develop simultaneously, as occurred in one of our cases. Rarely the neurological symptoms may precede the parotitis by several days, as occurred in cases reported by Casparis,[3] Walker,[22] and Weissenbach.[24] Finally there are some cases in which the meningo-encephalitis would appear to be of undoubted mumps origin by virtue of epidemiological contact, but in which a parotitis never occurs or is so slight as to pass unnoticed. We have noted two such cases (Cases M. H. and D. H.). Similar cases have been reported by Morquio[16] and Wallgren.[23]

TABLE II. SUMMARY OF SYMPTOMS

Noted in 38 Patients

Presenting Symptoms:
Headache only—5 cases (13%)
Headache and fever—14 cases (37%)
Vomiting and fever—5 cases (13%)
Headache and vomiting—11 cases (28%)
Hiccough—2 cases (6%)
Fever only—1 case (3%)
Résumé of symptoms noted during course of disease:
Headache—33 cases (89%)
Vomiting—35 cases (94%)
Fever—All cases (100°-105°)
Lethargy—11 cases (30%)
Irritability—15 cases (41%)
Hiccough—4 cases (11%)
Dizziness—2 cases (6%)

The symptomatology, as noted in the thirty-eight cases we are reporting, shows a fair degree of uniformity (Table II). The presenting symptom is almost invariably headache, often quite intense. Vomiting occurred in practically all cases, but was usually not incessant and persisted for only one or two days. All patients had varying degrees of fever, in some only to 100 mouth; in others up to 105 rectal. Hiccough, lethargy, or irritability were inconstant and usually not pronounced symptoms. Rarely dilated pupils may be an index of cerebral involvement. Convulsions and focal paralysis have been recorded, but have not been observed in our cases.

The neurological examination almost always reveals neck rigidity and a positive Kernig. Variations in reflexes, Tache, Babinski, and pupil changes are not common and have no pathognomonic value (Table III).

TABLE III. NEUROLOGICAL FINDINGS

38 Reported Cases

Neck rigidity: 36 cases (95%)
Positive Kernig: 34 cases (89%)
Reflexes:
K. K. hyperactive—4 cases (11%)
K. K. diminished—6 cases (16%)
Pupils sluggish—2 cases (5%)
Positive Babinski—2 cases (5%)
Tache present—7 cases (19%)

Lumbar puncture was performed one or more times in thirty-three of our thirty-eight cases (Table IV). In all cases the fluid was clear. The pressure was generally slightly increased.

Three cases in which the fluid pressure was measured showed pressures of 10, 12, and 16 mm. mercury. The Nonne test was usually negative; occasionally a faint positive was noted in the phase II Nonne. The cell count varied from 6 to 980, with the usual count varying from 100 to 300. The cells were predominately lymphocytes; the highest polymorphonuclear percentage we noted was 18 per cent. Pedicle formation was never observed. Stained smears made in all fluids showed an absence of organisms. The essential spinal fluid finding, therefore, is a moderate lymphocytic pleocytosis.

TABLE IV. SPINAL PUNCTURE

Performed in 33 Patients

Pressure: Increased in 30 cases (93%)
Cell count: Varied from 6 to 980 (average 100-300)
Differential:
  Lymphocytes: 82 to 100%
  Polymorphonuclears: 0 to 18%
Nonne: Negative in all cases
Pedicle formation: Negative in all cases
Organisms: None found on stained smears in all cases

Of interest is the observation that spinal fluid pleocytosis occurs far more frequently than does active meningeal symptoms in epidemic parotitis. Teissier and Schaeffer[20] examined the spinal fluid in forty-five patients with mumps, nine of whom exhibited clinical symptoms of meningitis. In twenty patients without any neurological symptoms, a spinal fluid pleocytosis was noted. Similar findings are reported by Silwer,[13] with spinal fluid cell counts to 260 in neurologically asymptomatic mumps patients. Various others have reported in small series in which they found 20 to 50 per cent of mumps patients to have increased spinal fluid cell count. This would suggest that asymptomatic meningeal involvement is rather common in epidemic parotitis.

Mumps meningo-encephalitis persists for three to eleven days, with an average duration of about six days. We have found that the temperature returns to normal and the subjective symptoms clear up generally two or three days before the neurological findings are normal. Recovery has been rapidly complete in most of our cases. In one case, recurrent headaches occurred for three months after the acute illness, and then subsided entirely. Another child developed a central deafness of the left ear, which was not complete and later improved. In the literature, various other complications, as optic neuritis, focal paralysis, aphasia, and hemiplegia have been described, but the ultimate prognosis in these cases is usually good.

The differential diagnosis of mumps meningo-encephalitis is usually not troublesome. Essentially an awareness of the occurrence of this complication in epidemic parotitis readily leads to a correct diagnostic interpretation. The presence of mild neurological symptoms in conjunction with a high spinal fluid cell count and a negative Nonne is a valuable diagnostic criterion.

Tuberculous meningitis usually develops slowly; there is a cerebral cry, and the clinical symptoms when fully developed are much more severe. Early there is a higher polymorphonuclear count in the spinal fluid than in mumps meningitis. The pedicle formation in the spinal fluid, the Levinson test, and presence of tubercle bacilli are diagnostic.

Poliomyelitis shows many similarities, but is a disease of the late summer, whereas mumps is most prevalent in the winter and spring. In poliomyelitis, early paralysis and absent reflexes often develop. In the initial stages, the spinal fluid often shows a much higher percentage of polymorphic cells than does mumps meningitis.

Epidemic encephalitis, as well as the various specific encephalitides, are best differentiated by the absence of parotitis or of any definite mumps exposure.

The treatment of mumps meningo-encephalitis is chiefly symptomatic. Spinal puncture should be performed as a diagnostic procedure; it is often of value in reducing fluid pressure, particularly in those cases with persistent headache and vomiting.

Summary

1. A report of thirty-eight cases of mumps meningo-encephalitis seen during the past five and one-half years is made.

2. It is felt that increasing awareness of this complication will result in more frequent recognition and will indicate that meningo-encephalitis is the most common complication of preadolescent mumps.

3. The symptoms generally appear in from one to ten days after the onset of the parotitis and consist of headache, vomiting, and fever, with moderate neck rigidity and positive Kernig.

4. Lumbar puncture shows absent Nonne with a lymphocytic pleocytosis, usually of 100 to 300 cells.

5. The diagnosis rests largely on the recognition that such a complication does occur. To us, the relatively mild symptoms with a rather high cell count is a valuable diagnostic criterion.

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# CASE REPORTS

GRANULOCYTOPENIA

WILLIAM D. COVENTRY, M.D.[*]

Duluth, Minnesota

ALTHOUGH agranulocytic angina was described by Schultz in 1922 it is only recently that the various etiological factors concerned have been elucidated. At present it is believed to be a manifestation of drug allergy. Fitz-Hugh,[1] in a recent article on drug sensitivity in relation to certain blood and bone marrow reactions, mentions amidopyrine, dinitrophenol, arsphenamine and neoarsphenamine, gold salts, neostibosan, acetphenetidin, novaldin, causalin, quinine, cinchophen, bismuth, nervinol, plasmochin, and sulfanilamide as proved or suspected causes of agranulocytic angina. Other terms, such as agranulocytosis, pernicious leukopenia and granulocytopenia have been used to describe this condition. The essential hematological reactions are the same in all but as they vary in degree different names are applied. Granulocytopenia is a constant finding and this term has been generally accepted. Under this title I wish to report a case in which the offending drug was probably cinchophen. As only one case of this type has previously been reported it was thought that this presentation might be of interest.

T. R., white, male, a storekeeper, aged sixty-three, entered St. Luke's Hospital on September 20, 1938. He left eleven days later, on October 1, 1938.

His illness consisted essentially of a gastro-intestinal syndrome followed by an attack of polyarthritis. On August 5, six weeks before entrance to the hospital, he developed a pain in the right shoulder with abdominal cramps, and loose stools containing mucus and blood. Such episodes had been experienced before but never had there been blood in the stools. He consulted his local physician, who x-rayed the gastro-intestinal tract completely, with negative results. His symptoms persisted and he consulted another physician, who passed a proctoscope with negative findings. The stool did not appear abnormal but gave a four plus benzidine reaction. It was felt that he had an acute gastro-enteritis, so a bland diet, belladonna and alkaline powders were prescribed. From this treatment he experienced relief. There was a history of alcoholic bouts and this seemed to be the most probable cause of his gastro-intestinal symptoms.

On August 26, three weeks after the onset of intestinal symptoms, and at a time when they were completely relieved, he experienced an attack of polyarthritis involving the right knee, ankle and left wrist. This confined him to bed. After staying in bed for five days he obtained a prescription from a friend who alleged it had relieved his rheumatism. This prescription, which was composed of 7½ grain tablets of cinchophen, was taken one tablet every three hours for the three weeks preceding admission to the hospital. It gave him complete relief, especially when interspersed with anacin, of which he took about forty-eight tablets during this period. He was feeling quite well on this medication till several days prior to admission, when he developed chills, fever, somnolence and delirium.

In his past history it was noted that he had had rheumatic fever at the age of thirty-eight. No history of venereal disease could be elicited. There was also the history of alcoholism previously mentioned. He had always been noted for a stubborn, perverse personality.

On admission to the hospital he was acutely ill, irrational and delirious. His temperature was 101.6°, pulse 98 and respirations 24. The eyes showed arcus senilis and an icteric tint to the scleræ. There was no discharge from the ears. The nasal septum was deviated to the left and some serous secretion was present. The mucus membranes of the mouth were slightly pale, and the tongue was coated. There was edema and redness in the right peritonsillar area with erosion at the upper pole. The tonsil was enlarged. No actual ulceration was present. The neck was negative. No lymphadenopathy was present in any region. There were moderately coarse râles and dullness at both lung bases but no signs of consolidation. An x-ray of the chest was negative except for an

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[*] From the Department of Internal Medicine, The Duluth Clinic.

TABLE I.—GRANULOCYTOPENIA

Date	Hb.	Rbc.	Wbc.	N.	Seg. Pmn. E.	B.	Non Seg.Pmn.	Immat. Granul.	Mono.	Lym.
9-20	71	3.4	2,600	0	0	0	0	39	0	61
9-21	67	3.2	2,650	0	0	1	0	32	0	67
9-22				1	1	0	2	28	0	68
9-22—PENTNUCLOTIDE 10 c.c. I.M. q. 6 h. (total 60 c.c.)										
9-23	69	3.4	5,200	10	6	0	28	21	0	35
9-24			7,500	43	4	0	12	14	0	27
9-24—TRANSFUSION 500 c.c.										
9-26	74	3.5	12,700	47	1	0	5	29	0	18
9-27			17,300	45	7	0	10	26	0	12
9-28			17,000	44	2	0	2	28	0	24
9-29			15,150	47	1	2	7	19	1	23
9-30			11,750	57	5	2	5	8	2	20
10-1			12,000	73	1	0	8	1	3	14
11-1	78	4.2	9,400	61	4			0	7	28

azygos lobe. The heart tones were distant, but regular, and there was no enlargement. The abdomen was slightly distended but no organs were felt. The extremities showed no deformity. The reflexes were equal. Rectal examination showed slight enlargement of the prostate.

Laboratory examination revealed a hemoglobin of 71 per cent, erythrocytes numbered 3,470,000 and there were 2,600 leukocytes per cubic millimeter. A differential count revealed a complete absence of polymorphonuclears, with 61 per cent lymphocytes, 25 per cent metamyelocytes and 14 per cent myelocytes. Severe toxic changes were present. Several days later the platelets were found to be 365,000, reticulocytes 2.2 per cent, coagulation time 5 minutes and bleeding time 2 minutes. The icterus index was 14. Urinalysis showed two plus albumin. Later specimens were normal. Repeated stool examinations were negative. The Kline and Kahn tests were negative. Blood cultures were negative.

A sternal puncture was performed the day after admission. Films from the puncture material showed a paucity of mature granulocytes with an increase in metamyelocytes. Toxic changes were present. Nucleated red blood cells were scarce. There appeared to be a severe toxic depression of all marrow elements.

On September 22, forty-eight hours after admission, treatment with pentnucleotide was begun, 10 c.c. being given intramuscularly every six hours. The next day the white blood cells numbered 5,200 and 10 per cent polymorphonuclears were present. The following day the leukocytes were 7,500 and there were 43 per cent adult neutrophiles. On September 24 a 500 c.c. blood transfusion was given. Following this the white count reached 12,700 and the neutrophiles reached 45 per cent. For the remainder of his hospital stay the leukocytes ranged from 11,750 to 17,300 and the neutrophiles finally reached a peak of 73 per cent. In all, 60 c.c. of pentnucleotide were given. The hematological data are given in Table I.

Coincident with the improvement in the blood there was a sharp fall in temperature and pulse, and clinical improvement followed. At the time of discharge there was still some elevation of temperature and he complained of soreness and limitation of motion in the left wrist. He refused to be hospitalized longer.

Since discharge from the hospital he has been treated with iron, salicylates and local heat. The arthritis in the left wrist has subsided but he still has some aching on the dorsum of his hands and feet. While he was home he took one tablet of cinchophen. Fever and a generalized tingling sensation resulted. He has taken no more anacin. On November 1, one month after leaving the hospital, his hemoglobin was 78 per cent, erythrocytes 4,280,000 and leukocytes 9,400. The blood film showed 61 per cent neutrophilic polymorphonuclears, 4 per cent eosinophilic polymorphonuclears, 28 per cent lymphocytes and 7 per cent monocytes. The sedimentation rate was 25 mm. per hour.

The sequence of events in this case appears to have had its onset with a rheumatic fever which was treated with cinchophen and anacin (acetylsalicylic acid gr. III, acetphenetidin gr. 1½, quinine sulphate gr. ½, caffeine gr. ½) and culminated in granulocytopenia appearing three weeks after the commencement of medication. Numerous drugs are known to be capable of producing this syndrome through acquired sensitivity. Cinchophen, acetphenetidin and quinine are among these and one of these three substances probably operated etiologically in this case. Skin tests with the drug directly or after mixture with serum have not been very successful in detecting the offending drug. The actual ingestion of the substance followed by study of the blood is the best method of detection. I regret that this was not possible, but from the evidence presented by the patient, which was substantiated by his wife, it would seem that cinchophen was the cause of the granulocytopenia in this case. The icterus could also be explained by the action of cinchophen, for it is well known that this drug may produce a toxic hepatitis.

A case of agranulocytosis due to cinchophen has been reported by Shapiro and Lehman.[2] Their patient suffered from polyarthritis and a urethral discharge. He took 7½ grains three times a day for three weeks before symptoms developed. Blood counts on the fourth day of illness revealed a hemoglobin of 68 per cent, erythrocyte count of 3,680,000 and leukocytes numbering 3,000. The blood films showed segmented neutrophiles 1 per cent, non-segmented neutrophiles 2 per cent, eosinophiles 2 per cent, lymphocytes 93 per cent, monocytes 1 per cent, myelocytes 1 per cent. Icterus index was normal. Pentnucleotide (exact amount not mentioned) and transfusions were given and a leukocyte level of 4,000 was reached in seven days. The patient recovered. Sternal puncture on the twelfth day of the illness revealed a hyperplasia of the bone marrow with predominance of the younger granular elements.

The nature of agranulocytic angina and allied blood dyscrasias such as purpura and hemolytic anemia as affected by drugs has recently been discussed by Fitz-Hugh.[1] It is essentially a drug allergy, that is, an acquired sensitivity. No reaction follows the initial dose of the drug, but with repeated administration, sensitivity is increased until very small doses cause profound reactions. This occurs only in individuals who are conditioned for it. The factors responsible for this conditioning are multiple and at present not clearly defined but they probably include genetic influences, endogenous toxic factors, vitamin deficiencies, and endocrine factors associated with menstruation. Fatigue states and traumatic shock also play a part. In the case at hand subclinical hepatitis due to alcoholism or cinchophen may have been a conditioning factor.

The pathology of granulocytopenia is concerned with a maturation arrest. The bone marrow shows an active proliferation of immature granulocytes with absence of mature forms. When the offending drug is removed or when stimulus to normal maturation is provided, marked regeneration is evidenced by immature granulocytes appearing in the peripheral blood. In this case cessation of maturation was not complete, therefore regeneration with the appearance of myelocytes and metamyelocytes in the peripheral blood was present during the acute phase of the disease.

In conclusion, it is suggested that patients who are receiving drugs likely to produce acquired sensitivity be closely observed, especially when conditioning factors may be present.

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INTUSSUSCEPTION OF THE BOWEL IN ADULTS

WALTER HALLORAN, M.D.
Jackson, Minnesota

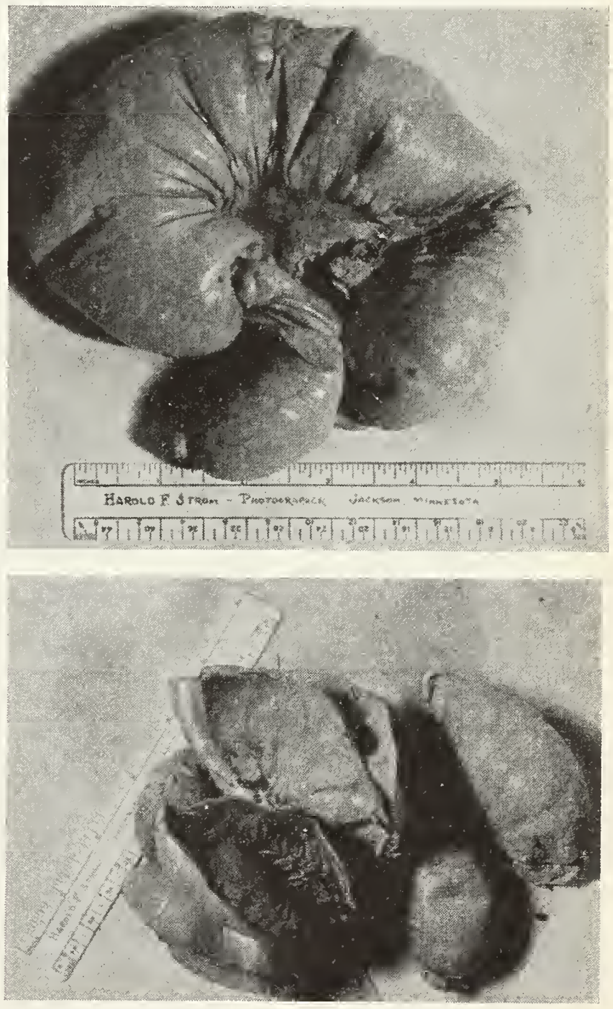
IN CASES of intussusception of the bowel in adults, a pedunculated tumor of the mucous membrane of the intestine has frequently been found to be associated. The following is a report of such a case:

Mrs. A., aged twenty, stated that for the past year her stools has been as a rule unformed and more frequent than formerly. Three weeks before, she had an attack of acute abdominal pain and vomiting which was abrupt in onset and lasted for about three hours. The present attack began about six hours before she was first seen by us, with sudden onset of rather severe abdominal pain, intermittent in character. She was vomiting small amounts frequently and was given a hypodermic injection of morphine gr. ¼ and atropine gr. 1/150 and sent to the hospital.

Physical examination showed a well nourished female, not having much pain at that time. Temperature was 98.4, pulse 72, respirations 18. General examination aside from the abdomen was essentially negative. There was no distention, she having had a liquid stool about three hours before. There was slight resistance and tenderness in the right lower quadrant but no mass could be felt. Pelvic examination showed slight tenderness to the right of the fundus of the uterus. The urine was normal; leukocytes 14,000. A diagnosis of acute appendicitis was made and the patient prepared for operation.

A muscle splitting incision was made on the right. There was dark blood-stained fluid free in the peritoneum. The appendix was kinked and the distal third was a little tense and injected but not acutely inflamed. There was an intussusception in the distal third of the ileum. As the mass was dark, edematous and friable and could not be reduced, it was resected and a lateral anastomosis made. The abdomen was closed with one penrose drain. Convalescence was delayed by an infection which developed in the cul-de-sac which was drained through the vagina. She left the hospital on the twenty-eighth day in good condition.

The resected mass comprised 22 inches of the ileum. A pedunculated tumor of the mucous membrane 2.5 inches in length by 0.5 inch in diameter presented in the lumen of the bowel at a point just distal to the point where the intussusceptum entered the intussuscipiens. This was evidently the cause of the obstruction.



(Above) Segment of ileum removed.
(Below) The bowel has been opened showing a pedunculated tumor of the mucous membrane.

The interesting feature of this case is the fact that the symptoms were not at all alarming. After the first attack of acute pain the patient had little or no pain and the pulse and temperature were normal, while the bowel at the time of operation had already undergone irreparable damage.

HISTORY OF MEDICINE IN RAMSEY COUNTY

BY J. M. ARMSTRONG, M.D.

(Continued from February issue)

1862

The war was now seen to be an affair of more than a few months. The physicians of Saint Paul who received commissions in the army were Dr. Wharton, surgeon to the Second Regiment, Dr. Vervais, assistant surgeon to the Fifth Regiment, Dr. Rieger, surgeon to the Eighth Regiment, and Dr. Rosenk, first lieutenant in the Second Battery Light Artillery. Dr. Hand, late in the year, was made medical inspector of the second corps of the Army of the Potomac, and Dr. Thomas Foster acted as commissary of prison camps and hospitals in Ohio.

As regards Rosenk, an amusing incident occurred showing the need of men for the army and the patriotism of our police court. It seems that one Von Glahan entered a complaint on April 17 against Rosenk for $2.50 for goods purchased. As Rosenk was under marching orders, Von Glahan evidently feared that he would not get his money. On Sunday he went to Rosenk's house to collect the money and Rosenk kicked him out; hence the complaint. After due consideration the court fined Von Glahan five dollars and costs for presenting his bill on the Sabbath day. The bill was probably for liquor, for a short time later Von Glahan was arrested and fined ten dollars and costs for selling liquor without a license; the fine was paid in city scrip, then worth ten cents on the dollar. Apparently bootlegging had its hazards then as now.

The governor appointed Dr. Willey to be chairman of the medical board for Minnesota to examine candidates for the positions as surgeons and assistant surgeons in the army. The Saint Paul Academy of Medicine and Surgery this year, despite the fact that most of its members were in the army, was an active organization, and the officers for 1861 apparently were elected at the annual meeting on the first Tuesday in May. They were: A. G. Brisbine, president; Samuel Willey, vice president; John Steele, treasurer; Alfred Wharton, secretary; and D. W. Hand, librarian. In January the Academy procured the services of Dr. D. B. Reid to give again a course of public lectures on chemistry at the Academy rooms in French's block on Third Street. French's block, a three story stone building, stood between Market and Washington Streets on the north side of the street. At this time George Benz's liquor establishment occupied the ground floor. The Academy had rooms on the second floor and Union Hall was on the third floor.

Dr. David Boswell Reid (1805-1863) graduated in medicine at Edinburgh in 1830 and was made a member of the Royal College of Physicians there the following year. In 1833 he was assistant to Dr. Thomas C. Hope, professor of chemistry at Edinburgh. The catalogue of the surgeon general's library lists thirteen titles by him. His system of ventilation, sanitation, and acoustics was adopted in the construction of the parliament building in London and St.

George's Hall in Liverpool. He was living in London in 1847. The reason for his coming to Saint Paul is unknown; possibly he came for his health. Upon his return to the East he gave lectures at the Smithsonian Institution and served as a member of the United States Sanitary Commission. He died in Washington, D. C., April 5, 1863; his family were resident in Saint Paul at the time of his death.

Dr. Vaiden, mentioned as a resident as early as 1855, and the writer of the book "America Vindicated" (probably the first book by a Saint Paul author and certainly the first by a Saint Paul physician), in January announced as the subject of a lecture to be given by him on January 8, "Human Government, What it is and ever has been—Empire; and what all Government should be * * *." The lecture was given at the court house and was favorably commented upon by the papers. Some time later he was assaulted on the street, but the assault seems to have been due to some disagreement over business deals rather than to any statements made in his lecture.

Among the new physicians who located in Saint Paul in 1862 was Dr. Underwood, of Chicago, who announced himself as an "eminent operator on the eye and ear." As he was a liberal advertiser he was able to secure a number of reading notices in the papers. He established himself at the American House. Wm. H. Duval, M.D., late of Brooklyn, N. Y., opened an office at Eighth and Wacouta Streets. Dr. Simonton, dentist, also came at this time and as he resided in Saint Paul for many years his arrival is worth recording. For a time he had an assistant named Dr. Hopkins from Boston. On September 2 appeared the first advertisement of "Dr. Galen's Dispensary and Venereal Infirmary, Chartered by the Legislature of Kentucky." This institution solicited business at its branch office in Concert Hall block on Third Street, and was conducted by Dr. Thaddeus Williams. It was later called the Galenic Institute. Thaddeus Williams was an elder brother of the late Cornelius Williams of Saint Paul. He sold the Galenic Institute to a Dr. J. W. Nabersberg in 1872 and died in Milwaukee about 1875. Dr. Nabersberg died in Saint Paul about 1920.

Captain Samuel Painter, of Saint Paul, who advertised in 1861 to cure cancer in less than twenty days "no cure no pay," continued his advertising. Dr. Brisbine was elected city physician at $400 per year, with the understanding that he would furnish his own medicines. Dr. Steele was elected alderman for the first ward for three years. Dr. Potts, whose term expired in March, was chosen to fill the vacancy on the School Board occasioned by the resignation of B. D. Beveridge in the second ward. The pension office was instituted in Saint Paul for the first time in 1862, and Dr. Samuel Willey and Dr. C. E. Cross, of Rochester were appointed examiners. It may be noted that Dr. Tavernier's house on Fourth Street caught fire and was damaged to the extent of $500 on April 3; that Dr. Berthier left in August for a three months' visit to France, and that Dr. Alberti was still in town. Dr. Wren, formerly of Saint Paul and later post surgeon at Fort Ripley, located in Saint Cloud, associating himself with one Dr. Palmer. Dr. Massey, who was at this time editing and publishing the *Press,* obtained by competitive bid the contract for the city printing. As his paper was anti-war in policy, a considerable political furor was aroused and the city council was obliged to rescind its action and give the contract to the *Pioneer*. Dr. Wm. Caine, prompted no doubt by a vicarious desire to suppress the Sioux Indian uprising, offered $25 for five Sioux scalps. Crops were bad this year and many people had difficulty making a living. It was then discovered that ginseng was plentiful in our woods and many made a living digging it. The price received then was only fourteen cents a pound; nevertheless on November 8 the barge *Minnesota* arrived from Saint Peter with twelve tons of the product on board which was sent to Baltimore for shipment to China. In all 241,245 pounds of it were shipped from Saint Paul during the year. The *St. Anthony News* stated that the sum of $80,000 was paid out for gingseng brought into that city during the previous year (1861). The removal to Nevada of Dr. C. L. Anderson, who settled in Saint Anthony in 1852, was recorded as having taken place on May 13, and his value to the state and government as a botanist and geologist was lauded. Dr. Rosenk apparently did not find army life congenial; for that or for some other reason he resigned his commission, and late in 1862 he returned to Saint Paul and advertised himself as a physician and surgeon, accoucheur, and dentist. In the *American Medical Times* for March 15 and 22, 1862, is printed an article on "The Climate of the State of Minnesota, and its adaptation to persons suffering from Phthisis Pulmonalis" by George Lewis, M.D., of Saint Paul, Minnesota. This is an extensive statistical study of the climatic conditions of Minnesota and is typical of the period in which it was written. The author was evidently from New York city, and the lack of any record of his practicing medicine in Saint Paul leads to the suspicion that his sojourn there was for the benefit of his health. The same journal for April 5, 1862, contains a card stating that William H. Davol, M.D., late physician to the Long Island College Hospital, Brooklyn, had removed to Saint Paul. This man's name in the Saint Paul papers is spelled Duval.

1863

This was the most discouraging year of the war and political discontent both in local and national affairs is markedly indicated in Minnesota papers. All the members of the Saint Paul Academy of Medicine and Surgery were in the public service except Drs. Willey, Steele, and Brisbine. Willey was tuberculous, Brisbine too large and heavy to serve, and Stewart was on parole though attached to a skeleton regiment. The pension service office was now so busy examining claimants that regular office hours were established. Drs. LeBoutellier and Dewey were surgeons of the Ninth Regiment. Shortly before the first of the year a Dr. William E. Barnes took up his residence on Seventh and Jackson Streets, though he hardly could have become settled until the first of the year. He stated that he might be consulted in either the English or the German language and would give particular attention to diseases of the lungs and throat. As his advertisement disappeared from the papers about four months later, he presumably remained only a short time. Dr. De Montreville, a dentist, took offices in French's block, where he remained many years. Dr. J. H. Stewart now made his first political venture, running for mayor, but was defeated. Dr. Brisbine, however, was elected school inspector for the fourth ward. The state legislature this year made an arrangement with the state of Iowa relative to the care of insane Minnesota residents in the Iowa Hospital for the Insane. As an instance of lunacy in Saint Paul, the *Pioneer* for May 25 cited the case of one Dr. Seimers who paid "half a dollar in silver as a fee for admission of a friend as a member of the Democratic Club." Apparently in the eyes of the *Pioneer* he was insane on two counts. As to Dr. Seimers, inquiry has elicited only the further information that he still owed Dr. Brewer Mattocks the sum of $2.50 *in gold;* at least Dr. Mattocks said so. Where anyone obtained gold at this time is a mystery, as the only money in circulation was "shin plasters." Perhaps if the editor of the *Pioneer* heard of Mattocks' having loaned Seimers that amount of gold, a second case of insanity might have been noted. The arrangement made by the Saint Paul Academy of Medicine and Surgery with the city council was still in force and we find that the members took turns acting as city physician. Willey served in April, Stewart in May, Potts in June, Steele in July, Stewart in August, Willey in September, Brisbine in October, and Steele in November. During this year the salary of the city physician was reduced to $300 per annum, but the Academy secured the position of county physician also at a salary of $100 per year. In 1862 Drs. Caine and Williams held the latter position.

In April the papers announced the death of Dr. LeBoutellier at Saint Peter, where he was then stationed. Dr. Vervais, who was assistant surgeon to the Eighth Regiment, resigned and arrived home in May and Dr. Armington of the Second Regiment also resigned. Although Armington was not a resident of Ramsey County, he lived across the river in Dakota County, possibly within the present limits of the West Side or West Saint Paul. It was later than this that the city of Saint Paul extended its borders on to the west bank of the river. Dr. Hand was captured by the enemy in May but was released and returned to his command. An arrangement was made between the two armies that medical officers should not be held prisoners.

Several new physicians came to Saint Paul this year. Dr. John H. Murphy moved over from St. Anthony in August, having resigned from the army on account of sunstroke. The rest of the newcomers were transient visitors of the advertising ilk. Dr. Phillip H. Hershey, oculist, aurist, and chemico-electropathic physician, established himself at the American House in June and remained about a month. Dr. Kennedy of Cincinnatti remained at the Merchants Hotel for a short time. He advertised to remove corns, bunions, warts, chilblains, and ingrown nails in from five to fifteen minutes. Dr. Benjamin Durkee established himself for a short time in September at the Minnesota House. He advertised "Dr. Benjamin Durkee's or The Poor Man's Eye Water," a panacea for all ocular affections. In May Dr. Rosenstraus, practical optician and spectacle maker, was at the American House for a week; and in September, Prof. M. Bernhardt, consulting and practical optician, was at the International Hotel. This man apparently obtained the confidence of the medical profession for he published recommendations from Drs. Willey, Stewart, Potts, and Steele. Bernhardt stayed in Saint Paul a month or two, then went to Saint Anthony, and Saint Cloud, and possibly to other towns. It is noted in the papers that measles broke out in the Indian camp at Fort Snelling in January, and that several deaths had occurred.

In May a discussion arose at the meeting of the city council relative to the care of city and county patients. It has been recorded previously that St. Josephs Hospital, or the building that had been built for that purpose on the present site of the hospital, had been closed, and that the old chapel of Saint Paul was used for the hospital. The original hospital building was used to house the Sisters. The surmise was made also that most of the city patients had been sent to the poor farm for treatment. This last is confirmed by a resolution passed by the council: "In general, patients should be sent to the County Poor Farm, but the Sisters' bill should be paid." This probably means that some city patients had been cared for at St. Josephs Hospital. This procedure was probably an economic measure. In August the council failed to pass a motion allowing ten dollars to Mary Cool for the use of her house for a negro having smallpox. In October the Hospital was moved back to the original St. Joseph's building on Exchange Street; since which time it has not been closed. An announcement in 1862 stated that private rooms might be had for $5.00 per week and ward beds at three dollars not including medicine and medical attendance. Patients were allowed to select their own physicians. In December the Saint Joseph's Academy building on Nelson Avenue was completed, having been started in 1862. The Sisters moved in from the two log buildings in Bench Street which were then abandoned.

On August 9 an article "Why Should the Climate of Minnesota Contribute to the Cure of Consumption" by Rev. S. Y. McMasters, M.D., was printed in the *Pioneer.* This seems to have been the first medical article by a resident to appear in print in our daily papers. Dr. McMasters came to Saint Paul as rector of Christ's Episcopal Church in 1862. He had studied medicine and also had taken clerical orders. In August an examining board appointed by the adjutant general of the state for the examination of medical officers for Minnesota regiments appointed George McD. Lambert second assistant surgeon to the Fourth Regiment, and E. Brewer Mattocks second assistant surgeon to the Seventh Regiment. Both men were residents of Saint Paul. The latter was a son of the Rev. John Mattocks, rector of the First Presbyterian Church. Lambert had been a hospital steward for some time and Mattocks was also a hospital steward in a volunteer regiment. While stationed at Saint Louis he had attended lectures at a medical school there and received a diploma. He was also a graduate of the Pennsylvania School of Pharmacy. Lambert practiced medicine in Stillwater after the war was over, and Mattocks settled in Saint Paul. Mattocks was the last survivor among the founders of the Ramsey County Medical Society, of the State Medical Association, and of the Minnesota medical officers of the Civil War. He resided at the Soldiers Home at the time of his death in 1934. The board which conducted this examination consisted of Drs. Stewart, F. R. Smith, and Brisbine. Dr. John Henry Seimers apparently was not very successful as a practitioner of medicine for he accepted the position of assistant jailer at the county jail, under Sheriff D. A. Robertson. Dr. Berthier left Saint Paul this year. He advertised for sale his residence, on the corner of Seventh and Wacouta Streets, and a small stock of medicines, glass jars, scales, et cetera. The newspapers stated he was going to return to France. Dr. Wharton, who remembered him very well, stated that he was a man of some ability though he was regarded as an irregular practitioner by the profession in Saint Paul.

Two events of quasi-medical interest were recorded this year. The first railway accident occurred when Capt. Abraham Bennett was killed, his buggy being struck by a train at the Lake Como crossing on July 3. In May a local undertaker brought the first hearse to Saint Paul. The *Pioneer* stated, "It is decorated with ostrich plumes and is fit for a Sybarite."

In the first part of this narrative mention was made that in the early days a cemetery was located on Jackson Street about where the city market now is. Apparently this fact had already been forgotten, for on October 2, Coroner Strother was called to view a body enclosed in a coffin that was exhumed while a lot was being graded at Jackson and Pearl Streets. The body was identified as that of D. B. Freeman by A. L. Larpenteur, who was Freeman's partner at the time of his death in 1849. This cemetery was on land owned by B. F. Hoyt, who allowed burials there. In addition to the names of physicians already given, the city directory for 1863 gives the name of one D. O. Regan as a botanic physician.

1864

Dr. Thaddeus Williams, of the Galenic Institute, hit upon an ingenious scheme to obtain the names of tuberculous patients in this vicinity. He published a reading notice in the papers of February 2 under "A Card to the Public," stating that he was preparing (by request) a paper for the *American Journal of the Medical Sciences* on "The Climatic Influence of Minnesota on Phthisis Pulmonalis," and asking the city physicians and those throughout the state to communicate with him. He listed fourteen questions he desired to be answered and requested the names and addresses of patients, promising, however, not to use names in the article in cases where publicity was not desired. Whether this brought in any number of names of persons to whom he might send his advertising literature is not recorded, but a perusal of the above named journal has disclosed no article on tuberculosis by him. A few days after his "Card to the Public" appeared, another notice appeared which throws some light on his history. In the letter he stated that he had been engaged in practice in Louisville, Kentucky, before coming to Saint Paul, and gave as references the names of several physicians in Louisville and Cincinnati, who probably enjoyed a doubtful reputation.

To physicians who served in our last war, it seems strange that a commissioned officer could resign from the army so easily during the Civil War. Dr. Reiger resigned and returned to Saint Paul in April, and Dr. Wharton resigned in August and returned in September. In the meantime other Saint Paul men entered the army. Dr. Robert L. Morris was commissioned assistant surgeon of the Eleventh Regiment, and Dr. Percival Barton, of West Saint Paul, assistant surgeon of the Seventh Regiment. Regarding Morris, no information is available. Barton, however, graduated from the University of Pennsylvania in 1849. While not a resident of Saint Paul, he lived near enough to be noted here. He spent the last years of his life on his farm at Inver Grove.

Although Dr. Rudolph Alberti lived in Saint Paul during the previous decade he had not up till this time advertised in the papers. In 1865 he announced that he was a graduate of the University of Berlin and that he could be consulted in the English, French and German languages. Three new physicians, other than those of the quack variety, became residents of Saint Paul this year. Martin Fossion, a French physician, arrived in May; Dr. H. Van Buren, late of Chicago, in July; and Dr. W. R. Simpson, of the Universities of Edinburgh and Dublin, in October. None of them remained more than a few months. As usual, the itinerant "doctors" were in evidence. Among them were Dr. Benjamin Phelps, oculist and ophthalmologist; Dr. Trallwill, who lectured on hygienic medication; and a Dr. Crees, "an old experienced medical electrician" who opened a hygienic boarding house on Seventh Street below Broadway. He came from Saint Anthony, where he had been connected with an institution of a similar character.

An incident worth recording, perhaps, regarding Dr. Murphy may be given here. While hunting near Fort Wadsworth he was thrown from his horse and gored by a buffalo bull which confined him to his bed for a fortnight. Smallpox was rather more prevalent this year than usual, and the city council felt justified in building a temporary hospital for contagious and infectious diseases, in July, on the county farm. A party agreed to finish it in a week at a cost of $130, and in October an appropriation of $49 for the care of these patients was approved.

The ginseng gatherers were busy again this year and during the week preceding October 16, 50,000 pounds were shipped out of Saint Paul. Most of this came from the vicinity of Taylor's Falls, and the competition among buyers became keen, the price rising from 25 cents to as high as 40 cents a pound for the green root. At the present time the wild root is very scarce and it would be a difficult task to gather a single pound in a day in the same locality.

As most physicians are sportsmen, it may be noted that three hunters killed sixty bears in the four weeks ending October 16 in the vicinity of Taylor's Falls. Deer also were very plentiful. Forest fires were prevalent in the north during the early autumn, and no doubt drove the game southward. The writer must refrain from repeating any of the fish stories reported. As regards politics, Dr. Stewart was elected mayor, and Dr. Brisbine school inspector for the fourth ward. The Saint Paul Academy of Medicine and Surgery still held the positions of city and county physicians. Brisbine took care of the offices in January, and Stewart in March. There is some question as to who acted for the other months. Dr. Mann was elected president of the State Agricultural Society. The directory for 1864 lists as physicians, John P. Kenna and Frank Dade. As their names appear in no other place they apparently remained in Saint Paul but a short time or else were obscure men. In June of this year the Protestant Orphan Asylum was organized, the officers of which were Mrs. Walter Webb, president; Mrs. S. Y. McMasters, vice president; Mrs. John Mattocks, treasurer; and Miss Postlewait, secretary.

An interesting episode regarding a physician occurred early in the year. It was the conviction of one Dr. J. W. Dibbs, of Saint Anthony, who was charged with attempting to secure fraudulent exemption of two drafted men from military service. Dibbs injected air, with a pump, under the skin of the chest of the men in order to simulate emphysema. Dr. Stewart detected the fraud. Dibbs confessed and stated he had received $25 from each of the men. Dibbs had been surgeon to Captain Fisk's expedition of 1863-1864.

Other disasters overtook two of our physicians during the year. A son of Dr. Thaddeus Williams fell into a cistern adjacent to his home and was drowned. Dr. Dewey's house was partially destroyed by fire and his valuable library totally destroyed. Of our physicians who were in the army, Dr. Rieger returned in March and Dr. Morton in December.

The year also marks the date of the first medical books issued with a Minnesota imprint. They were issued by the Galenic Institute; one was "A Private Medical Treatise," 350 pages, 110 illustrations; the other was, "The Youths Manual." Both were priced at one dollar and were of the type still issued by advertising medical institutes.

Drs. Murphy and Wharton now became associated and Drs. Caine and C. D. Williams dissolved partnership. Brewer Mattocks became understudy to Dr. Stewart. Stewart evidently needed an assistant as he was now mayor, surgeon of the board of enrollment, director of the Superior Railroad and the Second National Bank, and vice president of the Home Insurance Company, and was about to be appointed postmaster. A Dr. James Hunter now appeared in Saint Paul and advertised extensively in the papers. Only one reputable physician seems to have entered practice here this year. He was Dr. J. M. McMasters, a son of the Rev. Dr. S. Y. McMasters. He associated himself with Dr. Brisbine. He had been a hospital steward in the regular army, and although he returned to Saint Paul at this time, he did not receive his diploma till the following year. Later he moved to Sioux Center, where he resided many years. He died in Indiana at the home of his daughter in the second decade of this century.

(To be continued in April issue)

President's Letter

ON THE question of our relations and adjustments to the public in the practice of medicine, the office is receiving considerable comment and suggestion, particularly on the various phases that are being discussed in all of the popular magazines. The number of letters on the subject is so large that we cannot begin to mention the names of the writers. These letters and suggestions are all given careful consideration and they provide an important index of the opinion of the practicing profession on the questions at issue. Such interest should have the effect of uniting organized medicine in its study of the questions involved. The best studies can probably be made in small groups, formal or informal, where viewpoints are freely expressed.

Group medical plans are being studied or are in force in the following places: California, Michigan, Seattle, Washington; Missouri, Cleveland, Ohio; New York, Wisconsin.

The public is asking us for leadership without realizing apparently, that the questions involved are just as complex and human as problems regarding housing, clothing, personal relationships in the family, and all of the other conditions that enter into human health and happiness. Some people appear to feel that a medical heaven on earth can be brought about through some form of legislation. We find, however, that when we point out to individuals and groups the taxation involved in state medicine, also some disadvantages of government management and the danger to their own freedom of choice of physician, they commence to think of the practical implications.

The problem before us is that of presentation of the viewpoint of organized medicine so that the public will understand that we are anxious for adequate medical care and that we always strive to be progressive; that, if we question certain viewpoints, it is because we doubt their ultimate value or the practicability of carrying them out.

The practicing profession of Minnesota has stood behind and aided in the establishment of our state institutions for the mentally deficient, for tuberculosis, for public health boards and for our University. We have not taken a narrow attitude on these questions and we believe that there are many other problems in which the state is vitally and necessarily interested. These things should progress and gradually develop; but organized medicine also believes that voluntary practice has an important role in the health of the state.

The program of the month for March calls for Degenerative and Circulatory Diseases (including heart, kidney and diabetes). That interest continues is evidenced by the requests to the State Office for packets on the various monthly subjects. Interest is further evidenced by continued suggestions of subjects. Dr. O. H. Wangensteen called attention to the fact that appendicitis is still a major unsolved problem in the practice of medicine. Dr. B. J. Branton writes that nervous and mental conditions have been suggested to him as another important subject due to the general tension evidenced, not only here, but throughout the world. Probably we can work these subjects in; if not, and the program proves of continued interest, such subjects will be given consideration next year and the State Office will be very glad to have continued suggestions and constructive criticisms.

George Earl, M.D., *President*
Minnesota State Medical Association

Editorial

MINNESOTA MEDICINE

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BUSINESS MANAGER
J. R. Bruce

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A.M.A. INDICTED

IN AN editorial entitled "Group Hospital Association, Inc." which appeared in the September number of Minnesota Medicine, were related the essential facts pertaining to the proposed Grand Jury investigation of the Medical Society of the District of Columbia, the A.M.A., and some nineteen physicians by the United States Department of Justice. Some additional matters in connection with the investigation are worth mentioning.

On December, 1938, while the matter was pending before the Grand Jury a special assistant to the Assistant Attorney General Arnold, by the name of Douglass Maggs, announced in a public address at Milwaukee, the charges being made by the government, which were given widespread newspaper publicity. All lawyers know that the Grand Jury is the outcome of centuries of struggle on the part of the Anglo-Saxon race for freedom from unjust arrest. A Grand Jury made up of fellow citizens hears evidence in secret and determines whether arrest and trial are warranted. This attempt on the part of a lawyer in the Department of Justice to influence the course of Justice is not in accord with the accepted American idea of fairness. This is not the first time that Arnold has attempted to use propaganda in advance of a Grand Jury indictment.

Another measure has been used in the indictment of the A.M.A. in an effort to force the ideas of Assistant Attorney General Arnold on the medical profession. An offer was made to request the Court for a consent decree providing the A.M.A. would go far beyond the legal requirement in acquiescing to the demands of the government. Such a consent decree by the Court would have the authority of law, and thus the views of Arnold would establish the law instead of legislative bodies and the courts. This is not the first time that this method of obtaining a consent decree has been used by Arnold.

It is to be hoped that our A.M.A. officers will not be intimidated. Arnold has declared that criminal proceedings are much more effective than civil suits. Thus the physicians of the country are being indicted for actions alleged to be criminal.

The A.M.A. has been indicted for activities alleged to be in restraint of trade. It is unfortunate that the practice of medicine is labeled a trade. Although commercialism in medicine is admittedly too often in evidence, medicine is still a profession, the distinguishing feature being that money is not the prime consideration. There is plenty of evidence that science and service of humanity are still of more importance to the medical profession than financial return.

It was perhaps inadvisable for the medical society of the District of Columbia to expel members for other reasons than moral turpitude.

A medical society member has certain legal rights even in a society which has free rein in admittance to membership. It is unfortunate, too, that this test case is to be tried in Washington where members of the jury may well be prejudiced in advance simply because they live in a locality from which emanate ideas favoring changes in medical practice. We cannot, however, blame the medical profession of Washington for being militant in defense of private practice. The Group Hospital Association, Inc., though limited to the Home Owners Corporation employes, may well be expanded to include all government employes in Washington, which would mean government controlled medicine in our capitol.

Incidentally, the term "socialized medicine" is a poor one and should be dropped. Medicine is already socialized. What is opposed by the medical profession is government controlled medicine, with its political appointments, loss of free choice of physician, loss of free initiative in a country in which free initiative is still supposed to exist in other activities.

No one welcomes a suit and particularly a criminal suit. In spite of innocence, anyone will make every effort to avoid the publicity incident to legal entanglement. The mere fact that one is being indicted carries a certain reflection on the character of the defendant. The physicians of the country are in that position today. It is perhaps a strange coincidence that this A.M.A. indictment should have occurred just before the President's Interdepartmental Committee made its recommendations to be submitted to Congress for appropriations for increased government activity in medicine, which in ten years' time will amount to 850 millions of dollars a year. Will not any opposition on the part of the medical profession to this proposal be to a certain extent discredited by the mere fact that we are involved in criminal proceedings?

It is believed that the action against the medical profession is simply a part of a general program on the part of the federal government to break resistance to governmental domination of business and professional groups of citizens. For this reason the progress and outcome of the action are being watched with great interest by various business interests. Many newspapers have come to the defense of the profession editorially.

It is strange that in a country in which the system of free enterprise has been able, in the comparatively short period of 150 years, to establish living conditions far surpassing those anywhere else in the world, there should be such a swing on the part of government to abolish free enterprise through government competition and regimentation in almost every line of activity. Certainly there are enough citizens in our country who value freedom, to influence our legislators irrespective of party designation so they will resist all proposed legislation designed to ruin private enterprise, including the private practice of medicine.

C. B. D.

SULFAPYRIDINE IN THE TREATMENT OF PNEUMONIA

THERE has been considerable radio and press publicity regarding the remarkable curative qualities of a new drug related to sulfanilimide and known as sulfapyridine. Physicians are frequently asked about the use of this drug.

The answer is that so far sulfapyridine is not available for general use. According to the requirements of the new Food and Drug Law passed last year by Congress, new drugs cannot be sold until they have been sufficiently tried out experimentally and clinically so that their value has been established, and proper methods of administration and any possible dangers accompanying their use have been determined.

The first reports of the use of sulfapyridine in the treatment of pneumococcis infections, especially pneumonia, which appeared in England, were most optimistic. Reports of its clinical use in St. Louis and Philadelphia which appeared in the *Journal of the American Medical Association* for February 11, 1939, are also favorable. In the same number of the *Journal* appeared a report by Perrin H. Long which constitutes the preliminary statement of the attitude of the Council on Pharmacy and Chemistry regarding this new drug. The Council still considers the use of the drug not yet warranted. Although the reports mentioned are most encouraging the evaluation of new methods of treating pneumonia is difficult. New methods of treating pneumonia have come and gone and one becomes conservative in accepting too readily the reports of new therapeutic measures. The virulence of pneumococcic pneumonia varies so greatly in children and adults and in different localities, that extensive trial is essential before proof can be had that a new drug is entitled to replace, for instance, serum therapy. No one so far can answer the question whether sulfapyridine should replace or be used in conjunction with pneumococcic serum.

Until the profession obtains more complete knowledge regarding sulfapyridine, the well established methods of treating pneumonia which include serum treatment should be continued, although it seems likely that a valuable new drug is about to be available for the treatment of pneumococcic infections.

Distribution of Diphtheria Antitoxin and Toxoid and Smallpox Vaccine by the State Board of Health

Diphtheria Antitoxin.—Diphtheria antitoxin is distributed directly from the offices of the Board and through 250 distributing stations which are in charge of local health officers. Any physician who has immediate use for it may obtain antitoxin at any station. He is required to fill out a receipt and record blank accompanying each package showing its use. Any unused syringes must be promptly returned to the source from which it was obtained. Antitoxin may not be held for possible future use.

Diphtheria Toxoid.—Alum precipitated toxoid (one shot), formalin toxoid (two or three shots), and Schick test material are not distributed through distributing stations but directly from the offices of the Board in the State Office Building, St. Paul. Physicians may obtain any of these biologics in amounts they have immediate use for. Biologics may not be held for possible future use, and any unused vials must be promptly returned.

Toxoid for immunization campaigns or large group immunizations is furnished only when the plans for such immunization or clinic are approved by the respective county or district medical society.

Smallpox Vaccine.—Smallpox vaccine is not distributed through distributing stations but directly from the offices of the Board in the State Office Building, St. Paul. Vaccine cannot be furnished, as is toxoid, to physicians for use in their regular routine office practice. Such restriction is necessary because of the short potency of life of vaccine, the fact that unused or out-dated vaccine cannot be returned to the producer for either credit or exchange for fresh, and particularly because of limited funds.

Vaccine for campaigns and large group immunizations is furnished only when the plans for such immunizations are approved by the respective county or district medical society.

In Memoriam

William Dinwoodie

1854-1938

DR. William Dinwoodie was born October 1, 1854, at Manchester, England, while his Scotch parents, residents of Locherlie, Scotland, were there on a visit.

When fifteen years of age he immigrated with his family to America and settled in Acushnet, Massachusetts. Here he continued his studies. He received his medical degree from the Jefferson Medical School of Philadelphia in 1877.

After practicing for a few years in New Bedford, Massachusetts, Dr. Dinwoodie came to Saint Paul. He joined the Ramsey County Medical Society October 30, 1882, and opened offices on Dayton's Bluff, where he remained until 1915.

In 1886, Dr. Dinwoodie married Pauline Schwartz. They were blessed with three children, a girl and two boys. His wife passed away in 1913 and in 1915 Dr. Dinwoodie moved his office to his daughter's home, where he lived until 1930. At that time his daughter moved to California, and he made an extended trip east before entering the Masonic Home at Savage, Minnesota.

In his younger days Dr. Dinwoodie wrote short stories and poems under the pen name of Edwin I. Wood. These appeared in newspapers and magazines. He served as first president of the Dayton's Bluff Commercial Club. He was a member of the Ancient Landmark Lodge, A. F. and A. M., Minnesota Chapter, I.R.A.M., Osman Temple of the Mystic Shrine, Damascus Commandery, Knights Templar, and was also affiliated with the Odd Fellows, Modern Woodmen of America, and the Scottish Clans. He was a member of the Presbyterian Church and was a republican in politics.

Dr. Dinwoodie died May 12, 1938, following an illness of two months. He is survived by his daughter, Mrs. Burton Benham, a son James of Saint Paul, and a son George C. of Atlanta, Georgia.

Wilmot Edwin Patterson

1882-1939

Dr. W. E. Patterson, for twenty years a practitioner in Westbrook, Minnesota, died following a throat infection, January 15, 1939.

Dr. Patterson was born at Newburgh, Ontario, on October 22, 1882. He graduated from the Newburgh High School and attended medical school at Queens University, Kingston, Ontario, where he received his M.D. degree April 12, 1906. After serving an internship at Bellevue Hospital, New York, he practiced for a year in New York City, and for a year at Rembrandt, Iowa. The years 1910 to 1912 were spent at Westbrook, Minnesota. He then moved to Currie, Minnesota, and in 1918 to Hibbing. In 1919, he returned to Westbrook, where he remained.

In 1914, while at Currie, Dr. Patterson married Isabel Ruth Bragdon, who passed away in 1930. Six children, John, Robert, William, James, Elizabeth Jean, and Phyllis, survive him.

Dr. Patterson was an interested and active member of the Southwestern District Medical Society, the Minnesota State and American Medical Associations. A Presbyterian and a member of the Masonic order, he took an active interest in local public affairs. His was a life devoted to the high ideals of his profession.

David U. Surface

1868-1938

David U. Surface was born August 22, 1868, at Coffeyville, Indiana, and died at his home near Pokegama lake, Dec. 2, 1938. He received his certificate of pharmacy in 1892 and graduated from the Sioux City College of Medicine in 1896. He began the practice of medicine immediately after receiving his diploma in Leeds, Iowa, and later moved to Holly Springs, Iowa, where he operated a drug store in connection with his practice. Later he moved to Castana, Iowa, and then to Nemaha, Iowa.

In 1900 his health compelled him to abandon active practice and he moved to the Black Hills in South Dakota. Physicians were few and far between in that region in those days and he found it impossible to give up medicine. Men would persist in getting shot or otherwise damaged and babies still insisted on being born, and all and sundry needed medical attention.

In 1908 he moved to Ekalaka, Montana, determined to give up the practice of medicine entirely. Here he became acquainted with Dr. Albert S. Sherrill of Camp Crook, S. D., who made regular trips to Ekalaka. A lasting friendship soon developed and Dr. Surface took care of Dr. Sherrill's practice for several years while the latter was attending to his duties as a member of the South Dakota legislature.

When the influenza epidemic of 1918 broke out, the first victim in the little town of Marmarth, North Dakota, was their doctor. Dr. Surface was called immediately and worked day and night with little or no assistance all through the epidemic.

In 1920 he moved to Grand Rapids, Minnesota, where he resided on a farm near Pokegama lake until his death.

Dr. Surface's parents were farmers in Iowa and were financially unable to help him with his education. He left the farm while yet a boy and got work in a drug store, where he commenced his study of pharmacy. When he entered medical school his education was such that he had to study many of the common school branches along with his regular college work. The strain he was under in those days is thought to have been the cause of the early break in his health. He was a partial invalid from 1908 until his death.

Dr. Surface is survived by his wife; one daughter, Mrs. Henry Hegdahl; and two sons, William and Joy, having lost one son in an automobile accident in July, 1938.

An interesting incident occurred while Dr. Surface was in Marmarth. The town had a population of only about 1,000 and only one hotel, where he had engaged a room. Everybody in town knew where to find him so it was impossible to get any rest. One Frank Gibbs owned a hardware and furniture store with undertaking rooms in connection. Seeing that the doctor was about "all in" Mr. Gibbs asked him why he didn't go to bed and get some sleep. The answer was that it was impossible, everyone was clamoring for a doctor. Gibbs said, "You come with me" and he took him to the store and made up a bed in the embalming room. "No one will find you here," and they didn't. He slept the clock around.

THE MARK OF A MAN

A sensible man does not brag . . . You shall not tell me that your commercial house, your partners, or yourself are of importance; you shall not tell me that you have learned to know men; you shall make me feel that; your saying so unsays it. You shall not enumerate your brilliant acquaintances nor tell me by their titles what books you have read. I am to infer that you keep good company by your better information and manners, and so infer your reading from the wealth and accuracy of your conversation . . . The mark of the man of the world is absence of pretensions. He does not make a speech, he takes a low business-tone, avoids all brag, is nobody, dresses plainly, promises not at all, performs much, speaks in monosyllables, hugs his fact. He calls his employment by its lowest name, and so takes from evil tongues their sharpest weapon . . . Men take each other's measure when they meet for the first time—and every time they meet . . . Men do not convince by their argument, but by their personality.

—Ralph Waldo Emerson.

MEDICAL ECONOMICS

**Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
W. F. Braasch, M.D., Chairman**

THESE PRINCIPLES GOVERN CONTRACT PRACTICE

One of the most important of recent revisions of the Principles of Medical Ethics of the American Medical Association restates specifically the principles which must govern contract practice in all of its forms. Much misunderstanding and contention have developed in many parts of the country as a result of lack of understanding on the part of all concerned of these principles. They were adopted by the House of Delegates of the American Medical Association in 1937 and were explicitly accepted at the recommendation of the Committee on Contract Practice by the House of Delegates of the Minnesota State Medical Association as the measure for acceptance or rejection of all contract practice in Minnesota. They are reprinted here because their importance to every physician demands that he read and be familiar with them.

REVISED PRINCIPLES OF MEDICAL ETHICS OF THE AMERICAN MEDICAL ASSOCIATION—1937

Conditions of Medical Practice

Sec. 2—It is unprofessional for a physician to dispose of his services under conditions that make it impossible to render adequate service to his patient or which interfere with reasonable competition among the physicians of a community. To do this is detrimental to the public and to the individual physician, and lowers the dignity of the profession.

Contract Practice

Sec. 3—By the term "contract practice" as applied to medicine is meant the carrying out of an agreement between a physician or a group of physicians, as principals or agents, and a corporation, organization, political subdivision or individual, to furnish partial or full medical services to a group or class of individuals on the basis of a fee schedule, or for a salary or a fixed rate per capita.

Contract practice *per se* is not unethical. However, certain features or conditions if present make a contract unethical, among which are: (1) When there is a solicitation of patients, directly or indirectly. (2) When there is underbidding to secure the contract. (3) When the compensation is inadequate to assure good medical service. (4) When there is interference with reasonable competition in a community. (5) When free choice of a physician is prevented. (6) When the conditions of employment make it impossible to render adequate service to the patients. (7) When the contract because of any of its provisions or practical results is contrary to sound public policy. The phrase "free choice of physician," as applied to a contract practice, is defined to mean that degree of freedom in choosing a physician which can be exercised under usual conditions of employment between patient and physician when no third party has a valid interest or intervenes. The interjection of a third party who has a valid interest or who intervenes does not *per se* cause a contract to be unethical. A "valid interest" is one where, by law or necessity, a third party is legally responsible either for cost of care or for indemnity. "Intervention" is the voluntary assumption of partial or full financial responsibility for medical care. Intervention shall not proscribe endeavor by component or constituent medical societies to maintain high quality of service rendered by members serving under approved sickness service agreements between such societies and governmental boards or bureaus and approved by the respective societies.

Each contract should be considered on its own merits and in the light of surrounding conditions. Judgment should not be obscured by immediate, temporary or local results. The decision as to its ethical or unethical nature must be based on the ultimate effect for good or ill on the people as a whole.

Direct Profit to Lay Groups

Sec. 5—It is unprofessional for a physician to dispose of his professional attainments to any lay body, organization, group or individual, by whatever name called, or however organized, under terms or conditions which permit a direct profit from the fees, salary or compensation received to accrue to the lay body or individual employing him. Such procedure is beneath the dignity of professional practice, is unfair competition with the profession at large, is harmful alike to the profession of medicine and the welfare of the people, and is against sound public policy.

REPORT ON NORTHWEST REGIONAL CONFERENCE

The Northwest Regional Conference was held in Chicago on February 12. This conference was started in Minnesota some twelve years ago for the purpose of discussing economic problems of medicine. Beginning with a round table discussion in which representatives from Minnesota, Wisconsin and Iowa took part, it has expanded its territory so as to include more than 12 states in the Middle West. More than 150 men were in attendance at the sessions, including ten representatives from Minnesota, presided over by Dr. Carl Vohs of St. Louis. The program included a variety of subjects of current economic interest.

Group Hospitalization Considered

In the first paper, prepared by Major G. Seelig of St. Louis, group hospitalization was considered from a state-wide viewpoint. It is quite remarkable how rapidly group hospitalization has spread throughout the land. Organized medicine was somewhat skeptical about the plan at first, largely because it was feared that medical services would be included in the scheme. However, the public took to the idea from the first, and hospital insurance groups are now organized in most of the larger communities. In many states efforts are now being made to adapt the plan to rural areas. In Missouri, where the movement is well organized, the following measures were adopted to interest the rural districts:

Missouri Procedure

1. A state central committee was formed, in which every county was represented.
2. The farmers were enrolled throughout the state, with the aid of the Farm Bureau.
3. Many difficulties were ironed out, such as objections to the monthly payment, which were overcome by establishing a quarterly payment.

Although the response in urban centers was much better, nevertheless attempts to interest those in the agricultural districts have been quite successful. It is of interest to note that the administrative cost of group hospitalization in Missouri has been greatly lowered and that the average stay in the hospital has been reduced now to 8.5 days. They have been adamant from the start in exempting medical care and in recognizing the independence of the services of anesthetists, pathologists and roentgenologists.

Pennsylvania's Plan

The next paper dealt with the Public Assistance Program for the medically indigent in Pennsylvania, by the highly efficient and intelligent state secretary of the Medical Society of Pennsylvania, Dr. Walter F. Donaldson. The plan is somewhat similar to that adopted in many other states, but differs in that the county welfare committee includes representatives from all the agencies which are involved in caring for the sick. The care of the indigent sick was made responsible to the Public Assistance Department of the state and they turned to the state medical society for guidance. This plan was adopted in most of the counties of Pennsylvania under the guidance of the able secretary and is being successfully carried out to the satisfaction of all concerned.

"Despite Ingratitude"

Said Dr. Donaldson at this meeting: "To the physicians of Pennsylvania and to physicians throughout the nation interested in this great socio-economic medical problem of maintaining quality personalized medical service to indigent wards of the state—no longer to be considered 'charity' patients—we strongly advise patience, integrity and determination. We must apply these virtues to the problem until the taxpayers and their legislative representatives have had time to note that good medical service can not be produced without a fair outlay of money, and may not be maintained under any politically dominated administrative system.

"We need the patience to carry on in spite of defections and criticism within and without our profession. Determination and integrity are essential to the discharge of our definite obligations to the thoroughly matured spirit of our profession to render at all times and to all persons our best service, despite reciprocal misunderstanding or ingratitude. He who does public good for the many may find but few who are truly grateful."

The Pennsylvania plan might well be a model for any state which wishes a similar set-up.

The next paper, on Middletown Modernizes Medicine, by several representatives of organized medicine in Muncie, Indiana, shows to what extent careful organization of the county society can control and facilitate the care of the sick to the mutual satisfaction of all concerned.

School Health

Also of interest was the paper on The Physician's Role in the Public Health Program, by Health Commissioner Theodore Meyer of St. Louis County. This able representative of Public Health has adopted the sane viewpoint that the success of any public health program is dependent upon coöperation with the general practitioner. It was most reassuring to hear him describe the way in which the services of the general practitioner are employed in carrying out the public health program in St. Louis County. The reference of certain duties to the general practitioner and close coöperation between him and the health department has worked out very successfully. He decried the routine methods usually employed in the examination of school children and in its place instituted the plan of transferring their examination to the private office of the family physician. He believes in this way a better and more thorough physical examination can be obtained, rather than the cursory, rapid examination usually given. Confusion frequently resulted in carrying out the advice of the school examiner and physical defects noted by the routine school examination were seldom taken care of. The presence of the parents and discussion with the family physician concerning therapy indicated is essential. Additional advantages of this plan were: (1) parents were educated to have the child pay frequent visits to the physician, (2) the services of an expensive specialist often proved unnecessary, and (3) the percentage of therapy carried out was raised from 3 to 40 per cent.

Public health nurses are trained and instructed to coöperate with the family physician and to follow his instructions.

The success of the treatment of venereal diseases depends entirely on coöperation with the general physician.

"Like a Trout Fly"

Dr. Henry A. Luce of Detroit, president of the Michigan State Medical Society, expressed himself vigorously and picturesquely on the subject of the health security program of President Roosevelt—Michigan is now working on a voluntary health insurance program of its own.

Said Dr. Luce: "The National Health Program is an effort, under disguise, to place organized medicine under a government dictatorship.

"It is like a trout fly," he said, "beautiful to look at and it attracts the fish; but it has a hook in it."

In one place in the President's message, Dr. Luce pointed out, the government's responsibility in a federal health program was declared to be financial and technical, the creation and direction of programs being left to the states.

If the Government Wants It, Too

In another place it was pointed out that federal grants in aid would only be made to programs meeting federal approval.

"In other words," said Dr. Luce, "you can have any medical system you want, provided it is what the federal government wants.

"The recommendations of organized medicine have been ignored in the formulation of the federal program for expansion of medical care. Propaganda has been released to discredit the medical profession.

"If the forces that are now seeking government-controlled medical care continue unchecked, they will lead direct to a dictatorship that is communistic in thought.

Concerning Possible Dangers

Under the title of Supplementary Arrangements for Medical Care, Dr. R. G. Leland of the Bureau of Medical Economics of the A.M.A. made some very interesting observations concerning recent developments in the field of sickness and hospital insurance. He called attention to some of the possible dangers involved and his counsel will bear careful study by members of every state or county society adopting these plans. His remarks will not be discussed further here, since Dr. Leland is planning to talk on a similar subject to the Conference of County Officers in the near future.

Medical Survey

I was asked to submit a summary on the progress of the Survey conducted by the A.M.A. on the need and supply of medical and hospital care. Since the reports are far from complete and the data are in the process of being assembled preparatory for a final report to the A.M.A. in May, it was impossible to give any conclusions as to the final results. However, there were several points which were outstanding. In the first place, the percentage of physicians who appreciated the importance of the Survey and who coöperated in carrying it out unfortunately was comparatively low.

Physicians Lagged

It is quite apparent that the majority of physicians failed to appreciate the importance of the Survey and its practical significance. It is estimated that the returns from Form 1 which was filled out by doctors and dentists will be available from only about twenty per cent of the membership of the A.M.A. In contrast, the returns from the other forms filled out by allied agencies will average better than 60 per cent and in several states they will be almost 100 per cent complete. Some objections were made to filling out the three forms of 1F with references made to useless bookkeeping. In the Bureau of Economics are copies of 59 blanks which must be filled out at the end of each day by the physician in France if he wishes to collect his fees, and there are a greater number in Germany. Nevertheless, it is believed that there will be enough returns by March 1, when the final summaries will be made in the Bureau of Economics, so that a fair appraisal of the status of medical care in the U. S. will be available.

Estimate Exaggerated

One fact stands out rather prominently—the much quoted estimate made by Federal Health authorities to the effect that there are forty million people in the United States who lack adequate medical care is the wildest exaggeration. Forty thousand people would be nearer the truth, and but few of these would be barred from medical care if they cared to have it. There is considerable difference in the various sections of the country in available health services. In certain sections of the South and in some of the sparsely settled areas of western states, current economic conditions have made medical care unsatisfactory.

In most of the country, instances of failure in securing medical care have been amazingly few. The financial burden in certain groups seemed to be the greatest problem noted by many physicians and allied agencies.

Study Invaluable

Medical societies everywhere are endeavoring to solve this problem and will do so without federal interference. A large number of physicians expressed the desire for some form of voluntary sickness insurance controlled by organized medicine. The Survey should prove to be invaluable in giving for the first time fairly complete appraisal of the status of medical care and its facilities in the counties and states. This should serve as a guide as to ways for improvement of our present methods. Another advantage gained should be an increased coöperation in future. Certain it is that more surveys in the future will be necessary to progress.

W. F. Braasch, M.D.

POPULAR NEW PROGRAM

The Coördinated Medical and Public Health Program of the Minnesota State Medical Association is now three months old and some 500 requests for packets have already been received at the state office.

Three bulletins on the subjects of the month have been sent out to each member; the pneumonia bulletin in January, the pediatrics bulletin in February and the bulletin on degenerative diseases in March. Speakers have been secured for a number of medical societies on the subject and also for parent-teacher groups and others. A special series of newspaper articles has been sent to Minnesota newspapers for each month and the weekly radio broadcasts by Dr. W. A. O'Brien have been selected especially to further the program. A program of this type gathers momentum as it goes and, judging by its early popularity, the new program should be one of the most valuable activities ever carried on by the state association.

The regular News Letter from the state office which went, previously, only to county officers and committee members, is now being sent with the bulletin of the month, also, to each member.

News notes from county societies concerning meetings or other undertakings will be welcomed for this News Letter which is designed especially to disseminate organization news and which, it is hoped, will be read by every member.

DO WE WANT A JOB HOLDER?

Two recent editorials from the *Windom Reporter* (Minn.) are typical of the reservations which many Minnesota editors expressed with regard to President Roosevelt's national health program.

Paragraphs from each follow:

> "Roosevelt's latest appeal for popularity through federal care for the ills of mankind takes the line of socialized medicine. The American Medical Association is opposed to this scheme for a great many very good reasons, reasons which every voter should consider. Not the least of these reasons is that it will have a tendency to arrest and discourage advancement in medical science. Beyond that, there is the political patronage slant, the fact that in countries where it has been tried there is more sickness and fewer new and successful treatments discovered . . . The question is do we want to select our own family doctor or just a political job holder?"

With Special Alarm

> "Washington correspondent, Paul Mallon, says that Roosevelt's appeal to the dear people in the form of socialized medicine (a salaried doctor in place of your family doctor) was blown out of a window when it came before Congress. It didn't get as far as fixing world finance, the workmen's pay envelope, the price of railroad ties and a lot of other things. Of course if it had got through, we could expect with it an alarm clock for each person so arranged as to give a special alarm to wake the patient up when it was time for him to take the government medicine."

NOT A SUBSTITUTE

There can be little disagreement on certain fundamental objectives in regard to medical care. The medical profession agrees with all her agencies on the importance of the following objectives: the provision of good medical care for all the people; the development of comprehensive preventive and public health services; the development of appropriate measures to combat specific health problems; and a continuous, orderly improvement of the distribution of medical services and hospital facilities, both by geographic and economic divisions.

The medical profession would be the "last to deny the existence of medical needs" in the United States. Its whole mission has been to fulfill those needs, and it has always sought to meet every need at is arises by the development of appropriate medical services. The profession, however, cannot be blind to the fact that there are other unfulfilled needs, especially such as relate to food, clothing and housing, which are often as essential to the preservation of health as is medical care. It is impossible to isolate medical care from these other needs either with regard to the preservation of health or in the formulation of a health program; neither can medical care be looked upon as a substitute for such other essentials.

—*Bronx County Medical Bulletin.*

TEN DON'TS IN THE FRACTURE CASE

(Monthly editorial prepared by the Medical Advisory Committee)

That you may avoid malpractice litigation and its inconvenience, your Medical Advisory Committee submits the following DON'TS: IN FRACTURE CASES.

1. Do not attempt to treat a sprain or fracture without an x-ray examination.
2. Do not reduce a fracture with misplacement without some type of an anesthetic.
3. Do not reduce a fracture without competent assistance.
4. Do not fail to tell the patient the condition you are trying to overcome.
5. Do not apply a cast or splint without advising the patient of the symptoms of impaired circulation.
6. Do not fail to advise and insist on hospital care if you deem it necessary.
7. Do not neglect to see the patient often enough. Better many times too many than once too few.
8. Do not forget to advise the patient of the damage to soft parts and the possible result of this damage to function.
9. Do not let him forget that complete coöperation is expected by you during treatment and that only through such coöperation can best results be obtained.
10. Do not fail to make detailed records which should include history of accident, physical and laboratory findings—those present at time of examination and treatments—x-ray findings, dates of services rendered, splints and other materials used, advice given pa-

tient and information as to who may have heard this conversation. In fact, do not think any incident or happening too insignificant to warrant recording. Then file them carefully and permanently.—B.J.B.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

License of Minneapolis Physician Revoked

In the Matter of the Revocation of the License of George Frederick Lemke, M.D.

Following a hearing held before the Minnesota State Board of Medical Examiners on February 11, 1939, the license to practice medicine and surgery held by George Frederick Lemke, M.D., 512 Pence Bulding, Minneapolis, was revoked. Dr. Lemke was found guilty by the Medical Board of procuring, aiding and abetting a criminal abortion on a twenty-two year old Saint Paul girl. The Board also found Dr. Lemke guilty of conduct unbecoming a person licensed to practice medicine and detrimental to the best interests of the public in connection with the same case.

The girl, employed in the diet department of a Saint Paul hospital, was found dead on a table in Dr. Lemke's office on December 10, 1938. The evidence before the Board disclosed she paid Dr. Lemke $50 for an abortion; that she died while the abortion was being performed by Dr. Lemke. There was also testimony that Dr. Lemke performed from fifteen to twenty-five abortions per month; that his charges ranged from $50 to $300.

The records of the Medical Board show that Dr. Lemke was indicted for abortion in 1912 but was not tried until 1914 when he was found not guilty, in the District Court at Minneapolis. Dr. Lemke was also indicted in Federal Court in 1913 in Minneapolis charged with sending information through the mails on abortion. He was found guilty, then granted a new trial and finally acquitted.

Dr. Lemke was born in Saint Paul in 1879 and graduated from the College of Physicians and Surgeons at Baltimore in 1906. He was licensed in Minnesota in 1908 on reciprocity with New Jersey where he was licensed in 1907. Dr. Lemke was also licensed in New York in 1907.

INTRANASAL MEDICATION

Recently Walsh and Cannon (Ann. Otol., Rhin. and Laryng., 47:579, Sept., 1938) reported that the intranasal administration of oily preparations, when given in large total amounts and over a long period to normal rabbits free from upper respiratory infections, seemed to initiate lesions in the lungs which could be demonstrated in roentgenograms. These investigators found that isotonic saline solutions containing such vasoconstrictors as ephedrine hydrochloride and neosynephrin hydrochloride did not cause pulmonary damage after intranasal instillation in normal rabbits. The observations of these workers and the reports of others point to the potential dangers of intranasal medication and to the tentative conclusion that the only completely safe intranasal medicaments are weak saline solutions of appropriate vasoconstrictors. (J.A.M.A., Nov. 5, 1938, p. 1770.)

OF GENERAL INTEREST

Dr. O. F. Mellby is the newly named chief of staff of Mercy Hospital, Thief River Falls. Trustees of the hospital appointed him at their meeting on February 14.

* * *

Dr. and Mrs. M. Vik, who have been in the South for the past month and a half, returned recently to their home in Onamia. While away, Dr. Vik studied in New Orleans.

* * *

Dr. Karl C. Wold has announced the removal of his offices to 515 Lowry Medical Arts Building, Saint Paul, and his association with Dr. Robert W. Holman, in the eye, ear, nose and throat specialty.

* * *

For an indefinite period of time, Dr. D. T. Schuele, of the Gamble Clinic at Albert Lea, will include in his practice Emmons, Minnesota, and vicinity. He succeeds Dr. R. T. Trombley, who left recently for New Mexico.

* * *

Dr. Carl Coombs, formerly associated with Dr. R. C. Radabaugh of Hastings, Minnesota, has taken over the practice of Dr. Leila Gorenflo at Cass Lake. Dr. and Mrs. Coombs moved to their new home the first week of February.

* * *

On February 5, Dr. Leonard Johnston initiated his medical and surgical practice in Slayton, Minnesota, by opening offices in the Weck Building there. Dr. Johnston formerly practiced in Minneapolis. He and Mrs. Johnston are now making their home at Slayton.

* * *

Dr. P. E. Kierland, of Alexandria, Minnesota, has been appointed county coroner to fill the vacancy in this office occasioned by the death of Dr. J. A. McCabe. Dr. Kierland was appointed at the meeting of the Douglas County Commissioners on Tuesday morning, February 7.

* * *

On Tuesday, February 14, Miss Mary Loretta Lawler, daughter of Mr. and Mrs. Martin J. Lawler, of Rochester, became the bride of Dr. Walter F. Kvale, a fellow in the Mayo foundation. Upon returning from their wedding trip, Dr. and Mrs. Kvale will make their home in Rochester.

* * *

Dr. E. E. Novak of New Prague, former president of the Minnesota School Board Association, has been elected a member of the Board of Regents of the University of Minnesota, by the state legislature. Dr. Novak represents the second congressional district. His term expires in February, 1943.

* * *

Dr. Ludvig Hektoen, Executive Director of the National Advisory Cancer Council, U. S. Public Health Service, will present the Annual Minnesota Cancer Institute Lecture on April 17, 1939. Dr. Hektoen will speak on "Advances in the Knowledge and Control of Cancer."

* * *

Dr. Irvine McQuarrie, Professor and Head of the Department of Pediatrics, University of Minnesota, will speak on "The Significance of Inorganic Metabolism in Diabetes" at a joint meeting of the Wayne County Medical Society and the Detroit Diabetes Association on February 13, in Detroit.

* * *

Dr. Henry Porter Johnson, of Fairmont, Minnesota, veteran of half a century in medicine, celebrated his 84th birthday on the 3rd of February. The "Grand Old Man of Medicine," as he is affectionately called by people of his community, is still vigorous and active. He goes to his office daily and still makes calls on patients.

* * *

Dr. Arthur E. Hertzler of the Hertzler Clinic, Halstead, Kansas, and author of "The Horse and Buggy Doctor," will present the Sixth Annual Clarence E. Jackson Lecture on Thursday evening, March 16, 1939, in the Northrop Memorial Auditorium. The subject of Dr. Hertzler's address will be "The Morphology of the Thyroid Gland."

* * *

On February 24, Dr. E. T. Bell, Professor and Head of the Department of Pathology, University of Minnesota, will deliver the Christian Fenger Lecture of the Chicago Pathological Society and Institute of Medicine at the Palmer House in Chicago. Dr. Bell will speak on the pathogenesis of glomerulonephritis, including lipoid nephrosis.

* * *

Dr. George W. Clifford, of Osakis, recently has joined partnership with Drs. A. D. Haskell and P. E. Kierland, of Alexandria. He is filling the vacancy occasioned by the departure of Dr. R. W. Steube, who has been associated with Dr. Haskell and Dr. Kierland for the past few years. Dr. Steube is leaving Alexandria to take a postgraduate course in surgery.

* * *

Dr. Owen H. Wangensteen, Professor and Head of the Department of Surgery, University of Minnesota, gave the fifteenth Lewis Linn McArthur Lecture of the Frank Billings Foundation on January 27 at the Institute of Medicine of Chicago. Dr. Wangensteen spoke on "The Genesis of Appendicitis in the Light of Functional Behavior of the Vermiform Appendix."

* * *

Human convalescent serum is now available for the prevention or treatment of measles, scarlet fever, whooping cough and mumps, according to a recent announcement of the Human Serum Laboratory of the University of Minnesota.

Serum will be furnished at the standard price set by the American Human Serum Association.

* * *

Dr. Frederick C. Warnshuis, president of the American Medico-Legal Association, with headquarters at 137 Newbury Street, Boston, is desirous of receiving the names and addresses of Doctors in Medicine who have also received degrees from accredited law schools and have been admitted to the bar. All such are requested to submit their names and data regarding past and present medical and legal activities to him.

* * *

For the fifth consecutive year, the psychiatric staff of the Menninger Clinic, Topeka, Kansas, will offer a week's postgraduate course in *Neuropsychiatry in General Practice,* April 17-22. This practical presentation of dynamic psychiatry through lectures and case presentations has been attended by physicians from nineteen states in the past four years. Enrollment is limited to thirty. Address inquiries to Dr. Robert P. Knight, Chairman.

* * *

With talks before the Royal Society of Medicine, London, and before the Gesellschaft der Aerzte, Zurich, in prospect, Dr. J. G. Love sailed with Mrs. Love from New York for Europe on Saturday, February 11. While Dr. and Mrs. Love are touring the continent, Dr. Love will make a special point of visiting clinics in Italy, Switzerland, Belgium, Holland, the Scandinavian countries, the British Isles, and France.

* * *

The Samuel D. Gross Prize of the Philadelphia Academy of Surgery, consisting of $1,500, is again being offered for the best original essay, not to exceed 150 pages, on some subject in Surgical Pathology or Surgical Practice. The essay must be written by one author, an American citizen, and should be sent to the Trustees of the Samuel D. Gross Prize, of the Philadelphia Academy of Surgery, care of the College of Physicians, 19 South 22nd Street, Philadelphia, Pennsylvania, before January 1, 1940.

* * *

Plans are under way for widespread use of a new visual educational method known as "isotype" in the Minnesota campaign against tuberculosis. Charts and booklets in which important information on health are graphically presented by use of symbols or stickmen will be distributed throughout the state in 1939 as far as Christmas Seal funds permit, according to an announcement made by Dr. E. A. Meyerding, Executive Secretary of the Minnesota Public Health Association.

"Tuberculosis Spreads in the Household"; "Protecting One Protects Many"; "Tuberculosis Germs Are Passed from Person to Person in Many Ways"; "Tuberculin Tests and X-ray Discover the Infected and the Sick," are a few of the messages strikingly presented by stickmen on the charts.

Developed by Dr. Otto Neurath of the International Foundation for Visual Education, of the Hague, Holland, inventor of isotype, with the coöperation of the National Tuberculosis Association, the charts represent the most modern approach to the educational problem.

REPORTS and ANNOUNCEMENTS

MEDICAL BROADCAST FOR MARCH

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 11:00 o'clock every Saturday morning over Station WCCO, Minneapolis (810 kilocycles or 3702 meters) and Station WLB, University of Minnesota (760 kilocycles or 395 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota. The program for the month will be as follows:

March 4—Diabetes Mellitus
March 11—Heart Disease
March 18—Hardening of Arteries
March 25—Artificial Dentures

AMERICAN ASSOCIATION OF OBSTETRICIANS, GYNECOLOGISTS AND ABDOMINAL SURGEONS

The American Association of Obstetricians, Gynecologists and Abdominal Surgeons announces that the annual Foundation Prize for this year will be $100.00. Those eligible include only (1) interns, residents, or graduate students in Obstetrics, Gynecology and Abdominal Surgery, and (2) physicians (M.D. degree) who are actually practicing or teaching Obstetrics, Gynecology or Abdominal Surgery.

Competing manuscripts must (1) be presented in *triplicate* under a nom de plume to the Secretary of the Association before June 1, (2) be limited to 5,000 words and such illustrations as are necessary for a clear exposition of the thesis, and (3) be typewritten (double-spaced) on one side of the sheets, with ample margins.

The successful thesis must be presented at the next annual (September) meeting of the Association, without expense to the Association and in conformity with its regulations.

For further details, address Dr. James R. Bloss, Secretary, 418 11th Street, Huntington, W. Va.

AMERICAN ASSOCIATION FOR THE STUDY OF GOITER

The next annual meeting of the association will be held in Cincinnati, Ohio, May 22, 23, 24, 1939. Dry and operative clinics, as well as lectures, will occupy the three-day session.

The Van Meter Prize Award of $300 and two honorable mentions for the best essays concerning original work on goiter problems will be awarded at the meeting. Information regarding submission of papers, which must be sent in before April 15, may be obtained from Dr. W. Blair Mosser, 133 Biddle Street, Kane, Pennsylvania.

NORTH DAKOTA STATE MEDICAL ASSOCIATION

Tentative Program of the Annual Meeting, Fargo, N. D., May 8, 9, and 10, 1939

Fargo Auditorium
May 8, 1939
Morning Session

Diagnosis and Management of the Surgical Gallbladder.—Dr. E. M. Jones, St. Paul, Minn.

Paper on Obstetrics.—Dr. J. H. Moore, Grand Forks, N. D.

Paper on Obstetrics.—Dr. Ralph A. Reis, Chicago, Ill.

Problems of Latent and Wassermann-Fast Syphilis.—Dr. H. E. Michelson, Minneapolis, Minn.

Afternoon Session

Dermatology for The General Practitioner.—Dr. H. E. Michelson, Minneapolis, Minn.

New Methods in The Treatment of Gonorrhea in the Male and the Female.—Dr. L. W. Larson, Bismarck, N. D.

Diagnosis and Treatment of Eye, Ear, Nose and Throat Conditions.—Dr. A. D. McCannel, Minot, N. D.

Proctology.—Dr. L. A. Buie, Rochester, Minn.

May 10, 1939
Morning Session

Emergency Orthopedic Problems.—Dr. H. J. Fortin, Fargo, N. D.

Surgical Paper.

Pediatric Paper. (Author and subject to be announced later.)

Cardiac Emergencies.—Dr. F. J. Hirschboeck, Duluth, Minn.

Afternoon Session

Tuberculosis.—Dr. G. A. Dodds, San Haven, N. D.

Hypertension.—Dr. S. Marx White, Minneapolis, Minn.

Diagnosis and Treatment of Gastrointestinal Hemorrhage.—Dr. F. J. Hirschboeck, Duluth, Minn.

STATE MEETING

Any member who has original scientific work to exhibit is urged by the Committee on Scientific Assembly to communicate immediately with state headquarters of the Minnesota State Medical Association.

An unusually fine scientific exhibit is now being arranged for the 86th Annual Meeting which is to be held at the Minneapolis Auditorium May 31, June 1 and 2, and special effort is being made to secure as many exhibits as possible from individual physicians. Following a precedent of many years, the Southern Minnesota Medical Association will present a gold medal for the best such individual exhibit to be presented at the meeting. The winner will receive his award at the annual banquet scheduled for Thursday, June 1, at the Curtis Hotel.

The most varied and extensive meeting ever held by the association is planned for this Minneapolis gathering. A public health exposition which will occupy the entire ground floor of the Auditorium is planned for the three days of the scientific meeting and the following Saturday, June 3, as well. This show will be held under the sponsorship of the association and with the close coöperation of the State Department of Health, the University of Minnesota, and the Minneapolis city health department.

The first two days, Wednesday and Thursday, will be devoted exclusively to scientific papers and discussions with round table luncheons each day on special subjects. Leaders for these luncheons, which are to be limited in attendance to twenty for each one, will be drawn from visiting speakers and members who are leaders in their respective specialties.

The second Congress of Allied Professions will occupy the entire program for Friday, with several national leaders in public health and welfare as speakers, and a frank discussion of current economic and social problems as they affect health and medicine, planned. Hospital administrators, nurses, dentists, pharmacists and others will be invited to attend this meeting.

Business sessions of the Council and House of Delegates will begin on the afternoon of Tuesday, May 30, Decoration Day.

MAYO FOUNDATION CLINICAL WEEK

A special program of lectures and demonstrations in surgery and medicine will be held under the direction of The Mayo Foundation from April 11 to 15, inclusive. Mornings will be devoted to surgical and medical clinics. In the afternoons and evenings presentations of various surgical subjects will be made and symposiums will be conducted on heart disease, arthritis, gynecology, gastro-enterology, oxygen therapy, pneumonia and bronchial asthma. Visiting physicians are invited to attend.

CENTER FOR CONTINUATION STUDY

The Center for Continuation Study of the University of Minnesota in coöperation with the Minnesota State Medical Association announces a series of six-day postgraduate courses in special fields of medicine. The program will be held in the special building devoted to postgraduate education for all professional fields. This building also serves as a residence hall for professional groups while in attendance at the University.

Subjects will be Nervous and Mental Diseases, March 13-18; Diseases and Injuries of Bones and Joints, March 13-18; Diagnostic Roentgenology, March 27-April 1; General Surgery, April 10-15; Diseases of Blood and Blood-Forming Organs, April 17-22; Obstetrics, May 1-6; Gastroenterology, May 8-13. The tuition for each course will be $25.00. Room and Board may be secured for $16.00. Physicians from outside of Minnesota are admitted on the same basis as residents.

For further information, write to J. M. Nolte, Director Center for Continuation Study, University of Minnesota, Minneapolis, Minnesota.

AMERICAN COLLEGE OF SURGEONS

A Sectional Meeting of the American College of Surgeons will be held at Winnipeg, Manitoba, March 29, 30, 31. Fellows of the College from Minnesota, South Dakota, North Dakota, Saskatchewan, Alberta, Western Ontario and Manitoba will meet at the Fort Garry Hotel, Winnipeg. The Executive Committee on local arrangements is composed of J. A. Gunn, M.D., O. S. Waugh, M.D., G. S. Fahrni, M.D., J. D. McQueen, M.D., C. W. Burns, M.D., W. A. Gardner, M.D., R. B. Mitchell, M.D.

A meeting on Health Conservation will be held at Grace Church on March 31, for the public.

AMERICAN COLLEGE OF PHYSICIANS

The twenty-third annual session of the American College of Physicians will be held in New Orleans, March 27-31, 1939. An extensive program consisting of scientific addresses and round table discussions will occupy four and a half days interspersed with entertainment features.

Dr. William J. Kerr of San Francisco is president and Dr. O. H. Perry Pepper of Philadelphia, president-elect. E. R. Loveland, 4200 Pine Street, Philadelphia, is the executive secretary of the College.

BLUE EARTH VALLEY SOCIETY

The Blue Earth Valley Medical Society, comprising Faribault and Martin Counties, met at Fairmont January 26, 1939. Twenty members were present at dinner at the Fairmont Hotel and after a short business meeting a program on pneumonia was given.

Dr. F. A. Gunlaugson, District Health Officer of Mankato, gave a talk on pneumonia serum and Dr. Walter M. Boothby of the Mayo Clinic gave a demonstration of the new oxygen mask and spoke on its usefulness in the treatment of disease.

The following are officers for 1939: Dr. H. H. Russ, Blue Earth, president; Dr. P. W. Demo, Wells, vice president; Dr. W. C. Chambers, Blue Earth, secretary-treasurer; and Dr. R. C. Hunt, Fairmont, delegate to the State Association.

GOODHUE COUNTY SOCIETY

The Goodhue County Medical Society held a business meeting on Friday, January 20, at which Dr. Grant F. Hartnagel was elected president. Dr. A. W. Jones was re-elected vice president, and Dr. E. H. Juers was re-elected secretary and treasurer.

WASHINGTON COUNTY SOCIETY

The Washington County Medical Society held its regular monthly meeting Tuesday evening, February 14, in the Stillwater club rooms. The meeting was devoted entirely to the discussion of medical care of indigents, welfare work and hospitalization. Two county commissioners, two hospital board members and one welfare official took part in the discussion.

◆ WOMEN'S AUXILIARY ◆

Mrs. W. B. Roberts, Minneapolis, *President*
Mrs. E. V. Goltz, 2259 Summit Avenue, Saint Paul, *Publicity Chairman*

The Executive Board of the Women's Auxiliary of the Minnesota State Medical Association met February 1 at the Women's City Club, Saint Paul, with Mrs. Wm. B. Roberts, the president, presiding. Mrs. E. M. Hammes of Saint Paul was the social chairman. Despite the weather conditions the meeting was well attended. A most interesting report of the National Board meeting was given by Mrs. Roberts. After hearing reports from the various chairmen and the county presidents, plans were discussed for the annual meeting which will be held in Minneapolis the last of May and the first of June. A cordial invitation to all members to attend this meeting was extended by the Hennepin County president, Mrs. R. R. Cranmer. A nominating committee was appointed to complete a slate for the annual election of officers in May. Serving on this committee are Mrs. B. F. Davis of Duluth, Mrs. Charles Bolsta of Ortonville, Mrs. Martin Nordland of Minneapolis, Mrs. A. E. Nichols, Saint Paul, and Mrs. J. W. Stuhr of Stillwater. At the luncheon meeting the group had the pleasure of hearing Dr. George A. Earl, president of the Minnesota State Medical Association, who gave a most inspiring talk on "The Medical Outlook." Mr. F. Manley Brist of the association's legislative department also spoke. A number of out-of-town members braved the storm and were present, including Mrs. John F. Norman, past president, Crookston; Mrs. A. C. Baker, president-elect, Fergus Falls, Mmes. J. W. Josewski, E. S. Boleyn and J. W. Stuhr, Stillwater; Mrs. Charles Bolsta, Ortonville. From Duluth came Mmes. Malcolm G. Gillespie, Thomas O. Young, Benjamin F. Davis and F. J. Elias. Mrs. Theodore Satersmoen attended from Pelican Rapids. Shakopee was represented by Mmes. N. S. Dungay, H. E. Wunder and P. M. Fischer. Mrs. James Blake, Hopkins, and Mmes. Clarence Moberg and R. N. Gunderson came from Lake Park. Minneapolis and Saint Paul were well represented.

* * *

The Hennepin County Auxiliary heard Dr. J. M. Hayes discuss "Socialized Medicine" at their meeting, February 3, which was held in the lounge on the twentieth floor of the Medical Arts Building. Mrs. Hamlin Mattson represented the hospitality committee and was assisted by Mrs. Ernest Meland and Mrs. Rollin E. Cutts.

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The Stearns-Benton Counties Medical Auxiliary met at the home of Mrs. Joseph B. Gaida in St. Cloud on February 9 for its February meeting and pot-luck supper. The spring flowers used throughout the rooms were in direct contrast to the wintry night outside. The valentine motif was used in decorations and in the menu. Despite the weather, there were nineteen present. Mrs. T. N. Fleming, the president, announced that *Hygeia* had been placed in eleven high schools and grade schools by the auxiliary. Money for this project is being raised by a series of benefits. So far, one bridge benefit has been given at the home of Mrs. Charles Donaldson in Foley with Mrs. H. B. Clark of St. Cloud assisting with the arrangements. Following the meeting, Mrs. R. N. Jones of St. Cloud gave a delightful book review on "The Citadel" by A. J. Cronin, after which the book was discussed by the members. The March meeting will take place at the home of the secretary, Mrs. P. E. Barringer, in St. Cloud.

* * *

The Washington County Medical Auxiliary held its regular monthly meeting Tuesday afternoon, February 14. The hostess, Mrs. J. W. Stuhr, entertained nine members and two guests at a valentine party. The afternoon lunch was preceded by the business meeting, followed by a short discussion led by Mrs. E. Sydney Boleyn on the perils of government-controlled medicine. Mrs. C. E. Proshek, wife of a Minneapolis physician and a Czechoslovakian, told of some of her unhappy experiences under that regime in her native country.

* * *

A meeting of the West Central Auxiliary was held December 15 at Morris, Minnesota. Dinner was served at 6:30 p. m. at the Merchants Hotel, with nine members present. After dinner, the members held their business meeting at the home of Mrs. F. W. Behmler. Mrs. I. L. Oliver of Graceville, the president, presided. Mrs. Ewing gave a splendid report on the state convention held in Duluth and Mrs. Bolstad gave a report on the State Executive board meeting held in Minneapolis. It was voted to have *Hygeia* placed in the school libraries, through the Auxiliary in Ortonville, Graceville, Wheaton, Clinton and Morris. Mrs. Bergen was elected chairman for the March meeting at which socialized medicine will be discussed.

* * *

The state president, Mrs. Wm. B. Roberts of Minneapolis, will attend the meeting of the West Central Auxiliary, March 8, and will also be a guest at the March 14 meeting of the Washington County Auxiliary to be held in Stillwater. Mrs. Roberts was a visitor in Brainerd, January 28, when she was the house guest of Mrs. J. A. Thebes, Sr., and attended the Auxiliary meeting there on that day.

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of January 11, 1939

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, January 11, 1939. Dinner was served at 7 o'clock and the meeting was called to order by the president, Dr. C. B. Drake, at 8:10 p. m.

There were forty-three members and three guests present.

Minutes of the December meeting were read and approved.

Dr. Thomas S. Roberts, chairman, announced that the Executive Committee had audited the treasurer's annual report, found it correct, and moved it be accepted. Motion seconded and carried.

Dr. Drake reported the recent death of Dr. Chester M. Carlaw on January 7, and appointed Dr. Herbert Jones to draw up a suitable memorial to Dr. Carlaw for presentation to the Academy.

Dr. R. T. LaVake, retiring president, announced to the Academy a bound volume, to be used as a reference book, compiled over the past twelve or thirteen years by Miss Crever. This covers the first fifty years of the Academy and contains information about charter members, past presidents, elections, officers, dates and places of meetings, and includes programs, where the proceedings and papers may be found published, et cetera, also an author index of all papers, theses, addresses, and most of the memorials and case reports presented in those fifty years—in fact, all available data she could gather from the published proceedings and the old minute books of the Academy; also a supplement containing a copy of the minutes of a Minneapolis medical organization known as The Unity Club organized in October, 1884, apparently the forerunner of the Minnesota Academy of Medicine, the membership of which apparently was the basis for the Minneapolis part of the Academy in October, 1887. This book is intended to be kept by the secretary of the Academy for reference and passed on to his successors.

Dr. La Vake read the Preface of the book. Dr. Harry P. Ritchie, under whose secretaryship Miss Crever began reporting the meetings in 1921, then made some remarks and proposed the following motion:

I move, Mr. President, that the Secretary be instructed to call this to the attention of the Executive Committee, not only with the idea of accepting and acknowledging this wonderful contribution, but to determine an honorarium which will be fitting and appropriate for Miss Crever's years of service to this Academy. Motion seconded.

Dr. C. D. Freeman then made a motion that a committee consisting of Dr. Ritchie, Dr. La Vake—and they to choose a third man—decide what she should receive as an honorarium.

It was suggested, there being a motion already before the Academy, that Dr. Freeman's motion be made as an amendment to the motion. Dr. Freeman assented, and the amendment was seconded and, upon vote, carried. The motion, as amended, was then seconded, and, upon vote, carried.

The scientific program followed.

THE CESAREAN PROBLEM

R. T. La Vake, M.D.

Minneapolis

Dr. R. T. La Vake, retiring president, then read his Presidential Address on the above subject, and showed numerous lantern slides of charts and tables. (To be published in full in Minnesota Medicine.)

Synopsis

During the past twenty-five years obstetrics has made great advances potential for the reduction of maternal mortality. Among these advances are: perfection of roentgen-ray technic, making possible the more accurate diagnosis of pelvic deformity and disproportion; improved treatment of pernicious vomiting by hydration, high carbohydrate therapy and vitamin B administration; the perfection of prenatal care, which should bring women to labor in better general physical condition and with the birth canal uninfected, and has made more widespread the earlier detection of approaching preëclamptic toxemia; improved treatment of preëclamptic toxemia, making the accession of eclampsia less frequent; the masking of attendants upon parturient women to avoid droplet infection; perfection of blood transfusion technic which has increased our command over the results of hemorrhage, shock and infection; incontrovertible evidence of the lower mortality rate of the low cervical section as compared with the classical operation; and the increased safety of local anesthesia as compared with inhalation anesthesia in cesarean section, especially when toxemia exists.

In spite of all these advances, the general maternal mortality rate has been reduced very little. This fact is rendered more striking when we consider that we have seen a narrowing of those areas previously inaccessible to medical attention; that we have seen tremendous educational campaigns which must have reduced the factors of public ignorance and apathy; that we have witnessed the wide extension of social service and public health nursing and the extension of special facilities for maternal care, including personnel and material, in nearly every town of appreciable size, and, year by year, though obstetrical education has had its faults and limitations, at least facilities for teaching have continuously improved.

A study of innumerable investigations as to the cause for the great discrepancy between what one would reasonably expect in the lowering of general maternal mortality and the facts as proved by statistics, insistently points to the widespread increase of unnecessary and often contraindicated operative interference as the outstanding cause. Prominent among such operative interferences, stands cesarean section.

The average incidence of cesarean section is ten times greater than it was twenty-five years ago. This increase in incidence has not been offset by a proportional decrease in average operative mortality.

A statistical study is made of results, indicating the correct uses of cesarean section and factors that influence the results. It is suggested that the problem of errors and abuses in cesarean section can best be solved by the punctilious carrying out of the hospital standard 3-b adopted by the American College of Surgeons in 1918, namely:

> "That the medical staff review and analyze, at regular intervals, their clinical experience in the various departments of the hospital, such as medicine, surgery, and obstetrics and the other specialties; the medical records of patients, free and pay, to be the basis for such review and analysis."

Such analysis in regard to cesarean section should bring out the following data:

1. Was there a consultation and, if not, why?
2. What was the indication?
3. If the indication was pelvic contraction, what were the findings of pelvimetry, Munro Kerr maneuver, or x-ray?
4. Was the child dead or alive at the time of operation?
5. Did x-ray give any evidence of deformity (hydrocephalus, et cetera)?
6. Was the section elective, or after a test of labor and how long a test?
7. Were the membranes intact or ruptured; and, if the latter, how long ruptured?
8. Had vaginal examinations or attempts at delivery been made?
9. Was there any evidence of infection at the time of section?
10. What was the blood picture? If signs of anemia, acute or chronic, obtained, were grouped and cross-matched donors at hand and used if indicated?
11. If the indication was eclampsia, why was cesarean section chosen in preference to conservative treatment?
12. If the indication was placenta previa, what measures had been taken to differentiate between the complete and incomplete variations and were grouped and cross-matched donors at hand and used as indicated? Was shock combated before operation?
13. If the indication was accidental hemorrhage, what decided the choice and were donors likewise prepared and used if indicated?
14. What operative technic was used and why?
15. Was the child at term, premature, or post-mature?
16. What anesthetic was used and why?

Such reviews and analyses, in conjunction with our mortality reports, would soon tell us the character of work that is being done in our hospitals, and, in addition, would indicate more rapidly and convincingly the errors to be avoided—whether they be errors of well-meaning conservatism or well-meaning radicalism. Discussion would quickly bring out abuses and general staff influence would tend to eliminate them more effectively than would set regulations.

The meeting adjourned.

A. G. Schulze, M.D., *Secretary*

SPLINTER INJURIES CAUSE LARGE LOSS

The Department of Labor has republished and put into national circulation a report of the Bureau of Industrial Hygiene of the New York Department of Labor, which gives astonishing figures on splinters as a menace in industry. They show that in the year 1929 New York employers paid out $350,000 in compensation on account of splinters. The cost to the nation was much greater.

It would be exceedingly rare to find a workman who has not experienced a splinter injury, the bulletin points out. Such accidents run from the most trivial to the most serious, ending in death. A sufficient number of cases have been investigated to disclose salient causes, sources, remedies and preventive means concerning splinter injuries.

The average person considers a splinter injury as of minor importance and in many cases it is, but there is no certainty that it will not result in the loss of a hand or arm and it may even cause death. A splinter makes a punctured wound which the layman cannot properly treat with antiseptics. The result is a tendency to infection. This is proved by the fact that 13 per cent of compensated injuries from all causes become infected, whereas 82 per cent of compensated injuries from splinters are infected.

Under the New York State Bureau of Compensation the New York city district includes the Bronx, Kings, Nassau, New York, Queens, Richmond, Rockland, Suffolk and Westchester counties. Every day about 35 splinter injuries are reported from this district. No less than 44 per cent of these involve infection and 36 per cent of them show loss of time.

MINNEAPOLIS SURGICAL SOCIETY

Stated Meeting, Thursday, December 1, 1938

Dr. George R. Dunn, President, in the Chair

DELAYED UNION OF FRACTURES

Robert Schwyzer, M.D.
Bulach, Switzerland

(Read by Dr. O. W. Yoerg)

A most annoying situation arises when after several weeks of treatment a well reduced fracture does not show any tendency to consolidate and the ends of the fragments have the disastrous look of two pointed sticks of wood with no callus at all between them. Whether this delayed union is due to the use of the Kirschner wire extension or the nonpadded plaster splint of Boehler, I do not know. Surely the endemic goiter, so common in Switzerland, plays its part in the etiology, but does not explain all the cases of nonunion. Out of some sixty fractures I have treated within the last three years, it happened twice in transverse fractures where there was no or very little comminution and only scant hemorrhage.

The first case concerned a healthy farmer of thirty-six years who had gotten underneath his haywagon when the cows had gotten loose. He suffered a transverse fracture about the middle of the right femur with little hemorrhage and no splintering at all. The leg was put up in a Kirschner extension. This was replaced by adhesive tape at the end of six weeks. By the tenth week there was still no union and I drilled several holes about the fracture, with no result at all. At the end of the sixteenth week there existed a definite nonunion; there was very little callus and the ends of the fragments showed all the signs that promised a true pseudarthrosis.

The other case was the one of a soldier, twenty-three years of age. While riding a motorcycle he was hit by another one coming from behind. The left femur, as well as both bones of the left leg were broken. When he first came under my treatment he had been under the care of another surgeon for eight months with the result that the femur had healed well. But there was present a pseudarthrosis of the tibia, while the fibula was consolidated. He had been treated by the Kirschner wire extension also. Later on a walking plaster-of-Paris had been put on the leg. I first tried to improve the condition by drilling holes in the bones about the fracture, but had no results at all. No doubt, the advance in the healing of the fibula may, in similar cases, prevent the consolidation of the tibia.

In both these cases I performed an operation that is outstanding for its simplicity, its gratifying results, and last but not least because it was first recommended by a well known Swiss surgeon, Prof. Matti, of Berne, the successor of Prof. DeQuervain in the chair of surgery. Matti has shown that new bone will quickly form within the periosteal sac when filled with chips of cancellous bone. The ossifying power of the transplant may be due to some hormones or enzymes (phosphatase). The transplant, at any rate, remains alive and stimulates the regeneration of the bone at the ends of the ununited fragments. The most important part of the transplant consists of spongiosa. The latter acts as a scaffold for the newly forming capillaries, permitting a rich blood supply full of bone-stimulating substances. Besides, it keeps open the medullary cavities of the fragments, a principle well known through the arthrodesis of the vertebral column.

The technic is simple. An incision is made over the site of the fracture down to the bone. The periosteum is split and retracted together with the other tissues. The marrow cavities of both fragments are exposed by cutting away slices of bone with a large chisel for about 5 cm. on both sides of the fractures. The disc of connective tissue between the ends is resected down to the posterior wall of cortical bone, leaving a bridge there to act as a hinge between the fragments. There exists now a sort of a trough in the bone. An incision over the great trochanter exposes the bone. This is opened by means of a chisel or a large drill and a certain amount of spongiosa scooped out by means of a sharp scoop. This spongiosa, together with the chips resulting from the formation of the trough, are packed well within the cavities of the fragments and over the pseudarthrosis. It is important to get the transplant well packed in the cavity in order to avoid secondary hemorrhage. The periosteum is now sutured over the bone chips. Usually no attempt is made to realign the fracture, though I have done it in a third case now under treatment. I suture the muscles loosely and do not use a drain, although this is recommended by the author. The skin is sutured loosely to allow for drainage. A plaster cast is applied at the end of a week to avoid pressure.

The result in both cases was excellent. At the end of six weeks the patients were allowed to walk without splints. The farmer was back at his work within ten weeks, and the soldier was doing service again as machine gunner after six months.

OPERATIVE CORRECTION OF RECURRENT DISLOCATION OF THE HEAD OF THE HUMERUS

Robert Schwyzer, M.D.
Bulach, Switzerland

(Read by Dr. O. W. Yoerg)

It takes no little courage to present a "new" technic for the repair of recurrent dislocation at the shoulder joint. Quite a number of different procedures are known, but apparently none of them gives entire satisfaction as to operative hazards as well as lasting results. However, there are two reasons for excusing me in calling your attention to the following procedure: first, it is not new as it has given its author uniformly good results in about ten cases—some as far back as ten years. Secondly, the operation is technically simple and free of possible hazards.

Although its victims acquire a great ability to bring the head back in its proper place by some twist of the arm, recurrent dislocation of the humerus hampers its bearers a great deal in their professional activities, as well as in sports.

Two different causes are responsible for the occurrence of recurrent dislocation. One, rarely met with, is based on an anatomical abnormality, an exaggerated slanting of the glenoid cavity towards the front and the midline, combined with a weakening of ligaments and muscles. This condition is usually bilateral, calling for operation on both sides, which has been done successfully. The other cause is the previous traumatic dislocation of the head anteriorly, the subclavicular or subcoracoid luxation. In this injury the anterior part of the capsule is always ruptured, either underneath the subscapular muscle or between this one and the teres minor. The tear of the capsule is situated at the lower and anterior portion of the joint, embracing as much as half of its circumference. Laceration of the subscapular muscle and tearing of ligaments about the joint are common. Quite frequent are fractures about the rim of the glenoid cavity or a tearing loose of the periosteum of the neck of the scapula as far back as to the subscapular bursa. Even after complete reduction of the head the healing of these traumatized, hemorrhagic structures takes place in form of a more or less extended scar. The latter, being connective tissue, in time becomes stretched, the articular space widens until it lacks an appropriate support for the head of the humerus. Now even slightly forced movements, especially overextension of the abducted arm, will bring the head out of its place and cause a recurrency of the dislocation. But contrary to the first real dislocation, where the head leaves the torn capsule and buries itself within the torn subscapular muscle, in the recurrent luxations the head of the humerus always remains within the capsule.

Conservative measures usually are of no avail. Para-articular injections of blood, as recommended of late, are not very promising either. There remains the operative treatment as the one of choice. The aim of the many technics described is to restore a proper support for the head, but the ways to reach this goal differ quite widely. Some of the authors fold or excise part of the capsule (Thomas) in order to lessen the intracapsular space or combine this with a shortening or anterior transfixation of the subscapular tendon (DeQuervain, Matti). Others fasten the head in its place by a ribbon of fascia lata (Henderson) or by using the tendon of the long biceps (Kirschner, Loeffler, Rey, Rupp) or by forming a sling out of the deltoid muscle. Though the immediate results of these technics have been good, late recurrences number quite high. The transplants lacking in good circulation degenerate and stretch, and besides, these procedures are complicated and pregnant with operative hazards. A third group of surgeons follows another line of thought. They aim to build up the anterior rim of the glenoid cavity by bony or periosteal grafts. Oudard splits the coracoid process longitudinally and fastens part of it onto the anterior aspect of the capsule. Eden uses a free graft of the tibia for the same purpose. Experience proves the latter two methods as the best ones. Eden opens the joint cavity always for inspection and removal of possible loose bodies. Brun, who has somewhat modified the latter's technic, does not as a rule do this. Not incising the capsule of course greatly simplifies the operation and removes one great hazard: possible severe infection or trauma to the joint surfaces with subsequent partial or total ankylosis. Brun has done ten cases with very gratifying results. They have been published in the *Schweizerische Medicinische Wochenschrift*, 35:844, 1936.

The principal points of his technic are: General anesthesia, strictest asepsis, upper arm in slight abduction, elbow at a right angle, forearm in supination. Incision is made along the anterior margin of the deltoid muscle, from the clavicle down to the point where the pectoral meets the deltoid. Flat hooks pull the pectoral together with the cephalic vein mesially, the deltoid laterally. The landmark of the coracoid process is searched for and the short head of the biceps dissected, pulling it mesially. Now the capsule lies free and relaxed within the back of the wound, as well as the subscapular muscle. It is not necessary to incise the latter. One can easily pull it downwards when rotating the arm inwardly. The palpating finger easily finds the margin of the glenoid cavity with its bony rim. Only exceptionally does the narrow incision allow one to do the next step under control of the eye. But this is not necessary.

The fingertip resting on the rim of the glenoid cavity, the periosteum is incised parallel to the rim for about 3 cm. and 1 cm. behind it. Using the raspatory, one looses the periosteum in the form of a pocket down to the bases of the neck of the scapula. The chisel cuts loose a small plate of bone, leaving it in connection at its base with the scapula, thus forming a cleft to receive the graft. This insures a solid healing on of the graft. The wound is now packed with gauze. In the usual technic a graft is taken from the tibia having the full breath of the latter and a length of about 7 cm., the graft to be about 4 millimeters thick, thinning out on the one end, and has to carry periosteum on the one side, bone trabeculæ on the other. On the thin end a little hole is drilled. The graft is then placed inside of the pocket on the scapula by means of a few blows with a hammer. It is to lie close to the joint capsule and to lean against the coracoid process, to which it is fastened by a silk suture through the aforementioned hole in its thinner end. A few stitches of silk are taken through the short head of the biceps and the joint capsule, thus burying the graft and fixing it still more in its new bed. A few sutures reunite the superficial fascia. No drainage is used. The skin is closed by silk or metal sutures. A plaster-of-Paris splint holds the arm in slight abduction. The sutures are removed on the tenth day, the plaster remains for about 5 weeks. The incision on the leg is taken care of the usual way, taking care to put the leg into a plaster splint for fear of possible fracture.

According to this technic I have treated two cases. The first one concerned a young girl with bilateral loose joints, but recurrent dislocation only of the right one. She was unable to do her housework or board a street car without having a recurrence at the slightest overextension. It is now more than two years since the operation and she has never had a recurrence, doing all her work. The convalescence was entirely smooth, the scar is hardly visible and the leg in fine condition.

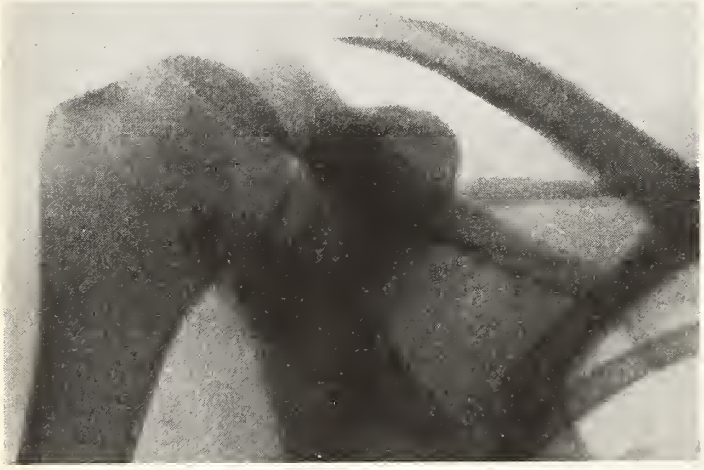

Fig. 1. Radiograph of shoulder made five months after operation shows bone transplant which has become somewhat displaced.

The other patient, a factory worker for twenty-three years, underwent a traumatic dislocation two years ago while engaged in a wrestling contest. The luxation was set and healed well but only to recur about every time he reached up to fetch something from a shelf. He is a very muscular type of a man and I had some difficulty to fit the graft into its proper place. He made a good recovery, being back at the factory within six weeks. He has not had a recurrence since the operation one and one-half years ago, although wrestling and doing military service as a machine gunner again.

Discussion

Dr. Vernon Hart (by invitation): I have had no experience with the anterior bone graft operation for recurrent dislocation of the head of the humerus. The method that I have been using is the physiological block, utilizing the long tendon of the biceps muscles which has its normal attachment of origin to the anterior and superior rim of the glenoid cavity. I am sure you are familiar with the operation.

There are two methods: (1) In the Nicola operation the biceps tendon is severed and introduced through a tunnel drilled through the head of the humerus and then resutured. (2) In the Roberts operation, the tendon is buried in the deepened bicipital groove of the humerus. In both operations the biceps tendon becomes fixed to the shaft just distal to the head of the humerus. The second method is much simpler and avoids many of the technical difficulties of the first.

I have seen several patients in other Clinics who have been treated by the anterior bone block method and the results were very satisfactory.

I would also like to say a few words relative to the first paper regarding the use of multiple cancellous bone chips instead of a massive compact bone graft for treatment of non-union fractures. The procedure is a very logical one because the amount of new bone that is stimulated from a bone graft depends on its surface area in contact with the surrounding tissues. If a massive bone graft is broken up into a multiplicity of small chips there is much more chance of revascularization with more egenerous callus formation resulting in solid union of the non-union fracture. The principle upon which the operation depends is that instead of a massive graft there is an abundance of small bone chips with a larger surface area in contact with vascular tissues. Revascularization is much more complete when using cancellous bone since there is a more abundant supply of osteogenetic cells and vascular cells. When using tissue for multiple bone chips, spongy or cancellous bone, I would suggest using the crest of the ilium where a great quantity of the bone may be obtained. I have enjoyed and greatly appreciated the two papers prepared by Dr. Schwyzer.

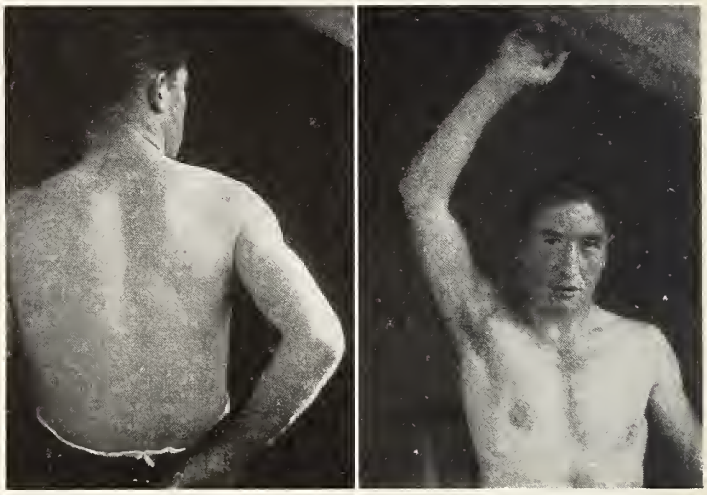

Fig. 2. Pictures of patient eleven months after operation.

A Letter from the Author

28th of September, 1938

Dear Doctor:

While there is big talk about war or peace again in old unsettled Europe I beg you to take the enclosed little papers of a country surgeon as a token that Switzerland is still quietly trodding along in the hope it may be spared the rigors of war. With greatest pleasure and hope, we all have read the message of your president to the world, still admiring the good common sense of the true American statesman. Our hope is that reason may rule over fanatisme.

The Surgical Society of Minneapolis has treated me so friendly and gentlemanly while I was still amongst you and ever since, that I felt it for a long time my duty to contribute something, ever so unimportant, for your meetings. Here it is. I dare to hope you may show or read it to the members and they may enjoy it. My English, of course, has suffered a great deal since I am forced to talk my country slang all day long. I beg you to pardon me for it.

A couple of weeks ago I had the pleasure of showing "my" hospital to Dr. Arnold Schwyzer who brought me long desired first hand news of Minnesota. Is it vain to wish to see one of you at my home at his next visit to Europe?

Many kind regards and good wishes to you and all others who ask about me. If you can't use the papers, throw them away.

Yours sincerely,

Robert Schwyzer, M.D.

THE INJECTION TREATMENT OF HYDROCELE

Arthur F. Bratrud, M.D. and Carl Eckhardt, M.D.
Minneapolis

Injection treatment of hydrocele has not been extensively used, but it is becoming more popular as the laity is becoming educated to the fact that they can be afforded relief by an office procedure which is not difficult, and without serious complications. In spite of modern improvements in surgical technic, patients are still reluctant in submitting themselves to surgery. Industry demands that patients be treated and returned to work in minimal time, consistent with safety.

The injection treatment of hydrocele has had its eras of popularity as well as those of disrepute. Treatment of hydrocele by the injection method can be traced to the Romans, at which time, Celsus injected salt peter into the tunica vaginalis. The procedure gained favor again during the seventeenth century, after a long period in which there was very little interest manifested in the method. Lembert treated cases by injecting sublimate which was dissolved in lime water. Two Scottish Army surgeons named Murro reported a number of cures using hot and cold water or red wine. In 1832, Sir Randall Martin of Calcutta discovered the use of tincture of iodine, where at a single hospital, 2393 cases were injected with iodine over a period of seven years and successful results reported in 99 per cent. Interest was manifested in this form of treatment by Kocher, Bull, McBurney, Billroth and Velpeau and they reported favorable results from the injection treatment. Huter of Germany is credited with first having used phenol, and in 1881 Levis of America popularized the treatment of hydrocele by the injection of this solution. He maintained that there was less pain, less sloughing, only two days away from work, and that more cures resulted. In 1903, Luke of Georgia used iodine and phenol and stated that results were very uncertain, resulting in considerable pain and swelling, and as a result the procedure fell into disrepute. Morestin of Paris, in 1912, treated cases by injection of equal parts of phenol, glycerin, and alcohol (Morestin's solution) after withdrawing one third of the fluid within the hydrocele. After treating a number of cases he modified his technic by withdrawing more fluid from the hydrocele sac and reinjecting more of the solution, and treating only simple hydroceles.

In 1912, Mellanah described a vaccine which he injected into the sac. This was discarded on account of the inflammatory reaction which followed, although the results were reported as good. In 1912, Bruns of Germany reported 1593 cases treated with phenol, having a recurrence of 6.1 per cent. In 1915, Soubeyron injected one gram of 40 per cent alcohol diluted with equal parts of water, without aspiration of any of the fluid. Zinc sulphate was later used by Dimmucher and Palaillon, but recurrences following this solution were high, and as a result it was abandoned. In 1922, Hoffman used one sixth cubic centimeter of alcohol and phenol, treating only simple hydroceles, not larger than an orange. Pain resulted from this solution, and if too large a quantity was used, or if any of the solution filtrated through the tunica vaginalis, cellulitis and suppuration occurred. Veazy, in 1925, introduced a sterile catheter into the collapsed sac. Prior to this a coil of sterile catgut had been used.

The treatment of varicose veins by injection of sclerosing solutions marked the greatest advancement in the safe treatment of hydrocele by injection. In 1930, Pybus reported five cases treated with quinine hydrochloride and urethane with excellent results. In 1931, Parritt and Levi treated thirty cases with sodium morrhuate, stating that cures resulted in all cases. Sharma in 1929 used a mixture of quinine dihydrochloride with 0.5 per cent salicylic acid, but results were not reported.

An excellent scientific study of solutions having merit for hydrocele injection was reported by Murray and Kilbourne in 1932. Their objective was to find a solution which would meet the following requirements: lack of pain, no disability, efficient to destroy all hydroceles without recurrence, non-toxic, bactericidal, and without danger of hemorrhage into the sac following injection. As a result of their work the solution of choice was quinine dihydrochloride 13.33 per cent and urethane 6.66 per cent. Of all preparations used it gave the best results with the least reaction. Most of the solutions previously used resulted in severe excruciating pain. Phenol produced severe pain when injected in strong solution or pure and it was believed that it produced a local cauterization and slower absorption. It was believed that phenol was more toxic when injected into the hydrocele sac than when injected into the abdominal cavity, for the liver detoxifies it, while in a hydrocele sac the liver becomes short circuited. Three cases of nephroses were reported by Murphy after injection of phenol in the treatment of hydrocele. L. W. Riba in 1933, reported the only case to be found in the literature of scrotal gangrene following injection of phenol for hydrocele. Quinine may produce complications, as cases of optic nerve atrophy have been reported following oral administration of quinine. From experimental work on rabbits by Kilbourne, injection of solutions into the pleural cavity revealed phenol to be five times as toxic as quinine. In 1935, Livermore introduced the technic bearing his name. After aspiration of the hydrocele with a large gallbladder trocar, the sac was packed with narrow shoe string tape saturated with five per cent sodium morrhuate. This tape was not disturbed for a period of twenty-four hours and then was gradually removed from day to day, being removed completely at the end of one week. From this procedure he reported sixteen cases with one recurrence. Kietzer in 1936, suggested the treatment of recurrent hydrocele by x-ray therapy. However, this method must be reserved for old men because of the danger of complete sterilization. Biederman in 1938 reported six cases treated with sylnasol, and all were cured.

Incidence.—Greene reported that 2 to 4 per cent of all urological admissions have hydroceles. Some say as high as 10 per cent. Fifty per cent occur after the age of forty years. The condition is bilateral in four per cent of the cases. Campbell and Caforio reported the largest hydrocele on record. This hydrocele contained five gallons. The incidence is highest among those people whose work subjects them to scrotal trauma, such as cowboys, circus riders, et cetera.

Character of Fluid from Tunica Vaginalis.—As reported by Greene, fluid from a simple hydrocele looks like urine, is slightly sticky, and tends to foam if the vessel is agitated. It is markedly alkaline, specific gravity 1.020-1.026, contains 4 to 6 per cent albumin, some fibrinogen, fibrin, salts, sometimes cholesterin, traces of glucose and occasional fibrin bodies and lime salts. Microscopically, a few endothelial cells, leukocytes, cholesterin crystals and lecithin bodies are found. Spermatozoa may be present if a ruptured spermatocele communicates with the sac. Red cells are found only in case of hemorrhage and bacteria only in infected cases.

Fluid from a spermatocele is hazy, opalescent and mildly alkaline. Specific gravity ranges from 1.002-1.006, there being only a small trace of albumin present. Microscopically, many dead sperm are present, but if there is an opening into a seminiferous tubule, many active spermatozoa are seen.

A hematocele contains blood and is always due to trauma.

A chylocele, which is rare in the temperate zone, is often seen in the tropics. It is caused from filarial infection. The aspirated fluid in these cases is milky and, when allowed to stand, a layer of fat accumulates on its surface.

Theory and Etiology of Cure by Injection.—The entire endothelium of the hydrocele sac could be damaged to cause an out-pouring of fibrin ferment. In theory this fluid should clot and cause obliteration of the sac. The supposition is that by introducing some fluid into the sac an irritation is produced, causing an inflammatory reaction within the serous lining, whereby the opposing surfaces adhere. Since endothelium is of mesodermal origin the repair process following this reaction leads to the production of fibroblasts and ultimately occludes the sac by fibrous tissue.

Huggins and Entz studied problems of absorption from the tunica vaginalis, testis, hydrocele, and spermatocele, and found there is a constant interchange of fluid within all serous lined cavities and any accumulation of fluid must be due to an imbalance of either secretion or absorption. They found marked delay in the absorption of dye from a hydrocele as compared with normal tissue of the tunica vaginalis.

Ewell operated upon one of their cured patients one month after the last of three injections of quinine and urethane. He found a small amount of dark, amber fluid, and several long strands of loosely attached and organized fibrin. Grossly, the testis and epididymis appeared normal. Microscopic section of the tunic wall showed the endothelium to be intact, the blood vessels appeared normal, and the subserous layer of tissue distinctly thickened and infiltrated with organized fibrous tissue.

They assume from this case that the resulting fibrosis of the tunic wall after injection interferes with the blood and lymph supply of the endothelium, and that this in some way changes the process of fluid formation.

Differential Diagnosis.—Hydroceles ordinarily are not difficult to diagnose, although at times some difficulty may be encountered. Where a complicating hernia is present it may be differentiated by transillumination of light through the sac, although this may not be present if incarcerated omentum is present in the scrotum. A spermatocele can be only differentiated from a hydrocele by microscopic examination of the fluid content, although very rarely will a spermatocele be seen that obtains any great size. In a chronic hydrocele which has been aspirated a number of times without having been given treatment, the sac may be extremely thick, and it may not transilluminate light very clearly. Any neoplasm, benign or malignant, can be determined by palpation, although, if complicated by a hydrocele, transillumination will not be so clearly shown. Aspiration of the contents, as a rule, shows a blood-tinged fluid to be present. Hematoma should not be difficult to differentiate as it usually follows injury and will reveal bloody fluid. A gumma of the testicle may or may not result in positive Wassermann of the blood, but examination of the spinal fluid should aid in the differentiation. The mass will not be transilluminated. Tuberculosis of the epididymis may or may not have associated hydrocele present. The nodular or indurated area of the epididymis would be indicative of pathology and this would contraindicate treatment.

The first cases which we treated were injected with glucose fifty per cent, in 1928. The results were good, but there was marked pain associated with treatment and following treatment, as well as marked edema. A few cases were treated with sodium morrhuate, but edema of the scrotum was marked and there was marked pain after treatment. When sodium morrhuate was used the reaction was of a more serious character, resulting in a thickened, indurated scrotum, and it seemed as though the entire side of the scrotum was one adherent mass. Since 1932, solutions of quinine urethane mixture recommended by Kilbourne (quinine hydrochloride 13.33 per cent and urethane 6.66 per cent have been used, and have been found to be very efficient with less reaction and better results. The ideal solution is one that is not painful, does not cause incapacitation, is non-toxic, bactericidal, and is efficient in the cure of hydrocele. Quinine hydrochloride with urethane comes closest to this of any solution used.

Indications.—The indications for treatment are confined to simple, chronic, non-infected types of hydrocele, and includes hydrocele of the cord. Hydroceles complicating a hernia where the sac is separated from the hernia can be treated. Wherever a hydrocele is complicated by epididymitis, tuberculosis, neoplasm, or syphilis, injection therapy is contraindicated. Nor should a case of abdomino-scrotal type of hydrocele be treated, as this is always associated with hernia and there would be danger of injecting the fluid into the abdominal cavity. Where there is calcium or cholesterol degeneration present in the sac, surgery is indicated. Hydrocele associated with undescended testicle is a surgical condition. Should the aspirated fluid be blood-tinged, then the case is surgical.

Technic.—The scrotum should be prepared the same as for any surgical procedure.

1. The scrotum should be shaved, washed with soap and water, and painted with any good antiseptic, mercresin, merthiolate, et cetera.
2. A bloodless area should be selected on the lower part of the scrotum, at which point a wheal should be made, using two per cent novocain without adrenalin.
3. After the bloodless area on the scrotum has been anesthetized, with an eighteen gauge needle attached to a twenty cubic centimeter syringe the fluid is aspirated as completely as possible. It is advisable to have an assistant hold the scrotum during this period of aspiration so as to lessen the danger of the needle becoming displaced during the procedure. After aspiration, the testicle and epididymis should be palpated to determine whether there is any evidence of tuberculosis, epididymitis, gumma or neoplasm. After complete aspiration has been made, and being satisfied that the needle is still in the tunica vaginalis, quinine hydrochloride and urethane mixture is injected into the sac, using not over two cubic centimeters at the first treatment. Should subsequent treatments be necessary, the quantity can be increased up to as high as ten cubic centimeters, although in our cases we have not used over four cubic centimeters. After the needle has been removed, the scrotum should be gently massaged so that the fluid will contact all parts of the sac. Sterile dressing should be applied over the sac after application of collodion. The patient should be told that fluid will recur immediately and will probably be as great or greater on the day following treatment, than it was at the time of treatment, but that he can continue his work as it will only be a question of time until swelling and edema of the tissues begin to disappear and absorption of the hydrocele fluid begins. No attempt should be made to re-treat the case or aspirate for at least six weeks. A firm fitting suspensory or athletic support should be worn after treatment.

Causes of Failure.—Causes of failure, in order of their importance, are:

1. Incomplete aspiration of contents of the hydrocele.
2. The use of too little fluid.
3. Too strong a solution.
4. Complicating conditions such as epididymitis or injury to the epididymis or testicle during procedure.
5. Production of a hematoma as the result of puncture of a blood vessel during aspiration.
6. Multilocular hydrocele.

Course After Treatment.—Occasionally, patients will have no pain or edema of the scrotum or scrotal tissue after the treatment, but the majority will have both. The pain will vary with the type of solution used, being nearly painless with the quinine mixture. With sodium morrhuate there is danger of allergy, and, on account of the condition of the scrotum after treatment, this was discontinued. There is edema of the scrotal tissues with recurrence of the hydrocele the day after treatment, but this will begin to absorb up to ten days, although it may require a period up to six weeks. These cases should be left without further treatment until absorption begins. When quinine hydrochloride is used there may be pain present, although in the majority of cases it is not of any serious character. When repeated aspirations are made the fluid will be found to be cloudy and contain fibrous shreds.

Complications.—When strict technic is carried out, the danger of infection is very small. When an avascular area is selected for the insertion of the needle there is little danger of hematoma. If no chronic infection is present there should be very little danger of epididymitis or orchitis. In other words, with properly selected cases complications should be rare.

Results of Treatment.—Of the cases which were treated with glucose solution, we were unable to obtain records, although results were good as far as they reported for observation. Since records were kept of any cases, seventy-two patients have been treated. Of this series, one was referred to surgery after receiving six injections, as there was a complicating hernia. Three patients were referred to surgery as the fluid was blood-tinged and neoplasms were suspected. At operation, diagnosis of neoplasm was confirmed. Cures have resulted in all cases, although some of the patients have required a large number of treatments. One received a series of twenty injections, although, if this patient were to be treated now, he would not be given as many treatments, but given more time so as to determine if complete absorption would not have taken place. This man had, however, a bilateral hernia which had been operated upon eight times, two of them being plastic repairs. Not a single patient has suffered enough pain and swelling so as to be disabled. When pain does occur it usually is present immediately after injection of the quinine urethane mixture, but it usually goes away in the course of one or two days. Two of the patients who were treated have had recurrence following surgery. One patient developed a hematoma, but cure resulted after aspiration of the bloody fluid. A man sixty-nine years of age, who was being given treatments for a scrotal hernia at the hospital, had severe pain associated with marked swelling and redness of the scrotum after treatment of a hydrocele on the opposite side, that contained over four hundred cubic centimeters of fluid. Purulent material was found on aspiration, although this was not confirmed by microscopic examination or culture. This patient has a cure with no more treatments or aspiration.

HYDROCELES

Age Group	1 to 10	10 to 20	20 to 30	30 to 40	40 to 50	50 to 60	60 to 70	70 to 80
No. of Cases	4	4	6	6	6	10	23	13

NUMBER OF TREATMENTS

	1	2	4	4	5	6	7	8	9	10	14	20
No Cases	35	11	5	4	1	1	11	0	0	2	1	1

Of the patients treated, three were referred for operation as the aspirated fluid contained blood. These all proved to have neoplasms. One was referred for operation after seven unsuccessful treatments. Two of those treated had previously been operated upon and had recurrence of the hydrocele. Both resulted in cures. One patient had purulent material on second aspiration, but this cleared up without drainage or other complication.

Conclusions.—In conclusion it may be stated that injection treatment of hydrocele with sclerosing solution is a practical procedure with simple technic, with definite advantage over surgical treatment, in the cases where there is no contraindication. It results in a very high percentage of cures if confined to chronic, non-infected types without associated disease such as neoplasm, tuberculosis, or syphilis, or in cases of abdomino-scrotal types of hydrocele.

Discussion

Dr. H. O. McPheeters: In these days of WPA, XYZ, et cetera, it seems that the only reputation a man need have for a job is to be on the inside, put up a good front and bluff. Just now, I feel a good deal that way, and I realize how incompetent I am to discuss this paper. However, I feel that only a few men have treated many of these cases, so I am happy for this chance to add my report.

Dr. Bratrud is to be congratulated on having the opportunity to see more than the occasional hydrocele, let alone presenting a series of 72 treated cases. It is the largest series as yet presented by any recognized authority.

This is just another one of the truly surgical procedures that is being taken out of the hands of the quack and placed on a sound, rational basis. As Dr. Bratrud said, Kilbourne and Murray's paper is by far the best paper that has been presented on the subject. They have gone into it most thoroughly and in detail from all angles and have covered it the best. They take up the differential diagnosis and this I believe is a very important point even though more theoretical than real; but it must be stated at the outset. They also take up the contraindications and emphasize that the abdominal-scrotal hydrocele is the one that should not be injected.

The hydrocele sac is, in a sense, a peritoneum-lined pouch. There is no reason why the peritoneum should not respond to irritants here the same as elsewhere. We all know the care we must take to avoid adhesions following abdominal surgery and how at times the surfaces adhere firmly together in spite of our efforts. This being the case, it is certainly logical that we should expect good results following the presence of known irritants. In my cases the reaction has been so severe that I feel sure the sac has been obliterated, even though, as Dr. Bratrud reports, some cases clinically cured, show the serous pouch still present. To me this is the one weak spot in all this work. More microscopic studies must be made of the hydrocele sac of treated cases.

I was surprised at being unable to find any good report on the tissue change developing in the sac following the injection of the sclerosing fluid. There is only the report of an occasional case that happened to come to surgery where there has been any study made of the hydrocele sac following the injections.

I have only cared for eight cases myself, two of these were bilateral; the youngest patient was sixteen years and the oldest sixty-four. I have used sylnasol, sodium linsoleate and sodium morrhuate. I have had good clinical results in all cases, with no untoward results. At the time it pained the patients severely and they complained of much soreness locally for several days as a rule. To me this is a severe criticism of it. One patient was in moderate shock for one hour due to the severe pain. This was following the use of sodium morrhuate.. This patient, however, got the quickest end-result of any and now, two months post-injection, the testicle is but little larger than the other one. In this case the hydrocele was about the size of the average hen egg and held about 20 c.c. of fluid. Two patients had the second injection.

I have seen one case of gangrene of the testicle following injection. (It was not mine.) I saw it when it was operated upon by another surgeon. The solution injected was not known and we could not find out. The patient did not know.

In all these reports, Bratrud, Kilbourne and Murray, et al, they say quinine and urethane is now the accepted solution. I cannot understand why we can inject 2 c.c. or even 4 c.c., or 5 c.c., or, as one writer says, 10 c.c. of quinine urethane solution into the hydrocele sac and not expect a slough. If you get 0.25 c.c. or less of quinine and urethane perivascular in a varicose vein injection you will almost invariably have a slough develop. I have seen so many sloughs myself and have had so many, I frankly admit it, that I absolutely will not use quinine and urethane in any way in varicose vein injections. How we can turn around and inject 2 c.c. to 10 c.c in a hydrocele sac which is closed and get away without any slough is not easily explained. It doesn't seem reasonable but all the authorities, including Kilbourne and Murray, in their large series, with Dr. Bratrud has stated previously in his papers on do it, so we have to accept it. Until the pathological reports give further proof, we will have to take it as it is.

One very important thing Dr. Bratrud spoke of but didn't emphasize enough, it seems to me, is the size of the testicle before your injection, thinking entirely of a medico-legal situation. You will oftentimes find, as Dr. Bratrud has stated previously in his papers on the "The Injection Treatment of Hernia," that you have an atrophy of the testicle when the patient first comes to you. One testicle may be much smaller than the other, and following the operation it makes a beautiful opportunity for a medico-legal situation, a malpractice and damage suit, to be developed.

One of the points in regard to technic that I do not think Dr. Bratrud brought out, and yet that I believe is important, is the introduction of the needle. I like to grasp the scrotum with my left hand, being right handed, and have the syringe and needle in my right hand. Always have the scrotum and hydrocele in firm grasp of your hand so that the skin above, as Dr. Bratrud suggested, is very tense. Second, introduce the needle and not only introduce it just through the skin and the sac lining, but well down inside at least an inch so that the needle is well inside the cavity. In my own cases, until I did that, I found that the needle would easily slip back and outside of the sac.

One of the things one man suggested, a very clever suggestion, was to have a two-way stop-cock between his syringe and his needle and then using a luer-lok syringe with rings for fingers and thumb he could aspirate the fluid while the assistant could turn the two-way stop-cock so he could discharge it and aspirate again and empty the hydrocele. I simply have the nurse unlock the syringe while I continue to hold scrotum, hydrocele and needle in the left hand and the syringe in the right. That works just as well.

I think it is very important to have the patient fitted, as Dr. Bratrud suggested, with a very tightly fitting all elastic jock strap and have it *in place* before you start your injection. Until I did that I had trouble. If you tell the patient to go home and get a jock strap and put it on and wear it afterward, he will not do it with the same care, caution and support that you want and I think it is very important, not only to have a tight fitting jock strap, but then to pad it up yourself with gauze and sheet wadding until you know that it is padded with extreme pressure. The more pressure you can have immediately after the injection, the less pain the patient is going to have during the next two or three days and the less possibility there is going to be of fluid recurring.

A great many complications will develop following this treatment just as there did in the early days of the injection treatment of varicose veins. If the operator is careful, uses common sense and good judgment, there should be no serious trouble.

THE ONE-STAGE ABDOMINO-PERINEAL PROCEDURE FOR RECTAL CARCINOMA*

Walter A. Fansler, M.D., F.A.C.S.
Minneapolis

This particular operation is presented, not because it is something new, but rather because it is a procedure which has been definitely accepted as having an important place in the operative treatment of rectal carcinoma. In the past, the only objection has been the high mortality rate. With the improved methods of preoperative preparation, postoperative care and better operative technic, this mortality rate has been substantially reduced. In a large series of cases it has been shown that, with experience, the operation can be performed with a low operative mortality, and it does possess certain definite advantages over other operative procedures. Miles, of London, who originated the operation, has reported several hundred cases. More recently, Jones, of the Cleveland Clinic, reports a series of three hundred cases with a mortality rate of 9.8 per cent. Rankin has operated upon seventy-five patients with a mortality rate of 6.6 per cent. From this report one would assume that Rankin accepts only the more desirable cases for this method of operation. In general, this method should be reserved for those patients who are in fairly satisfactory physical condition, and in whom the lesion is suitable for radical removal. For those patients in poor physical condition, less radical operations may be to their advantage. Our only contention is that in patients who are thought suitable for a radical abdomino-perineal removal of their growth the operation is best done in one stage rather than in two stages.

It is an accepted surgical axiom that the best operation for cancer is the one which permits the widest removal of the growth together with its gland-bearing area. In cancer of the rectum this is best accomplished by some form of abdomino-perineal operation. At least five advantages may be claimed for the one-stage operation over the multiple-stage procedure.

1. The entire operation is completed at one time. The patient does not have to submit to the danger, distress and worry incident to two laparotomies.

2. I believe the one-stage operation can be done more quickly, more easily, and with less shock than the second stage of the two-stage abdomino-perineal procedure. In opening the abdomen for the first time, the peritoneal cavity is usually clean and free of inflammation and adhesions. Under these conditions, the necessary dissection can be quickly and cleanly done. Upon opening the abdomen for the second time to complete the second stage of an abdomino-perineal resection, one almost invariably encounters adhesions and inflammation. The presence of this inflammation and the freeing of the adhesions greatly slows up the removal of the diseased bowel. In the Lahey operation, in addition to the above factors, the cut end of the distal portion of the bowel must be dissected free from the abdominal wall and inverted.

3. In doing a two-stage operation the patient is twice subjected to the inherent dangers of a laparotomy over which the surgeon has no control. Furthermore, the patient having had one laparotomy is within three to six weeks subjected to a second. The question is whether, in this length of time, any patient can make an adequate recovery from a laparotomy. I do not believe that many surgeons would advise two laparotomies in such close succession if it were possible to allow a greater length of time to elapse between them.

4. In the one-stage procedure the cancer is removed at once. In two-stage procedures the growth is left in the patient for three or four additional weeks. In case of complications, it may be two or three months. When a cancer is discovered, the patient is always advised to have it out "at once." Why is this not an important factor here? Who knows upon what day metastatic spread may occur?

5. The period of hospitalization and disability is less with the one-stage procedure. This factor, of course, is a minor one in comparison to the safety of the patient, but if safety is not sacrificed, then time should be considered.

With patients who are good physical risks there is but one condition where the two-stage procedure is better than the one stage. This is in patients who have a bowel obstruction which cannot be relieved by medical means. In such cases a preliminary surgical decompression should always be done to relieve obstruction. In the presence of obstruction, the removal of a rectal or colonic growth should never be attempted.

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*Read by invitation.

To date, I have operated upon twenty-eight patients by the one-stage abdomino-perineal method. From this experience and the observation of other operators, I have come to certain conclusions concerning it. I am presenting this paper to discuss these points.

The preoperative preparation is important, and I shall enumerate the more essential points. Sufficient time should be allowed for preparation. At least a week is usually necessary and more time should be allowed if thought advisable.

Anemia.—Many of these patients have a certain degree of anemia. We feel that in all cases the hemoglobin should be raised to at least seventy-five per cent before operation. Repeated transfusions is the quickest and best method of accomplishing this.

Weight Loss, Dehydration, Low Sugar Reserve.—It is not possible to build up weight loss, but a high caloric, low residue diet, together with transfusions will be a great help. Increased fluid intake and intravenous glucose improve the general condition of the patient.

Bowel Preparation.—The bowel should be empty at the time of operation. If there is no obstruction, one or two doses of an ounce of epsom salts will accomplish this. In the presence of moderate obstruction, it may be necessary to give, over a period of a week or more, daily doses of mineral oil and epsom salts. Small daily saline enemas are advisable until twenty-four hours before operation.

If these measures are carried out and physical and laboratory examinations reveal no serious organic lesion, the patient is usually ready for operation.

The operation is a formidable one. Simply as a matter of mechanics, there is a great deal to be done. Unless the surgeon organizes and coördinates the steps of the operation, he may be puttering around the entire morning. Prolonged operating time greatly adds to the risk of the surgical procedure.

Anesthesia.—In most cases the average surgeon must plan upon two or more hours of anesthesia. This means the administration of two spinal anesthetics, the combination of spinal and general anesthesia, or the use of general anesthesia throughout. We have tried all combinations. Until the development of a spinal anesthetic which would give at least an hour and a half of anesthesia, we were of the opinion that in most cases ether anesthesia with gas induction was the safest and most desirable. The reason for this was that it is often impossible to complete the abdominal portion of the operation within an hour. This made it necessary to switch to inhalation anesthesia in the midst of the abdominal operation. With spinal anesthetics lasting ninety minutes or more, one can complete, in almost all cases, the abdominal portion of the operation and have a residual anesthesia carried over for the perineal section. If necessary, a small amount of gas may be given for the completion of the perineal excision. We now use both types of anesthesia, spinal plus gas, or inhalation ether anesthesia alone.

A great number of special instruments are not necessary, but the operation is much easier if one has a very long pair of scissors, several very long hemostats, and a pair of long tension forceps. They enable the surgeon to work deeply in the pelvis and to see clearly what he is doing. With ordinary instruments, it is necessary to put the hand so far down into the narrow pelvis that the operative field is obscured.

With the aid of some slides, I will now go over the steps of the operation as we perform it. [Here, seven slides were shown and discussed.]

The postoperative care is most important, since in these patients death is usually due to some complication and not to the immediate effects of the operation. Transfusions are of great value. Almost all patients are transfused at least once. If there is evidence of shock the blood is given before the patient leaves the operating room. If there is no evidence of shock the transfusion is given later in the day. If the patient does not seem to snap back quickly, the transfusions are repeated for several days.

Nasal Suction.—We feel that nasal suction is most valuable in these patients. Suction is begun in all of these patients as soon as they are returned to their rooms. Where formerly the majority showed considerable distention with discomfort and borborygmus, now almost all have flat abdomens and are comfortable. We believe there is less chance of ileus or necrosis of the colostomy stump where suction is used.

Fluids.—There is usually considerable loss of fluid at the time of operation. We compensate for this by giving the patient 1,000 c.c. of five per cent glucose in Ringer's solution. If a transfusion is given, this may be omitted. The average patient will require about 3,000 c.c. of fluid in twenty-four hours to maintain his fluid balance. This is given as 1,000 c.c. of 5 per cent glucose intravenously and 2,000 c.c. of normal saline by hypodermoclysis. If the tongue seems dry and the urinary output is less than 800 c.c. the amount of fluid is increased. The patient should have sufficient fluid, but we believe that the indiscriminate use of large amounts of fluid, especially intravenously, may do more harm than good. Hyperventilation and frequent moving of the patient seems advisable, but more especially in older patients.

The use of acidulated fruit drops and chewing gum helps to keep the patient's mouth comfortable and to prevent the occurrence of parotitis.

These patients often have difficulty in voiding. For this reason a retention catheter is usually left in male patients. This renders repeated catheterization unnecessary, and keeps the bladder contracted for several days. When the catheter is removed and the bladder becomes distended, there seems to be greater ability to void than in those cases where the bladder has not been kept contracted.

The colostomy is usually punctured after forty-eight hours. This is done with a small cautery tip, anesthesia not being necessary. If the patient passes gas freely, fluids are given by mouth with the suction apparatus closed. If the fluids are well tolerated, suction is removed. The patient is then given fluids entirely by mouth and the parenteric fluids discontinued.

As has been stated, death usually occurs as the result of complications. The most frequent serious complications are peritonitis, pneumonia, ileus, obstruction, sepsis, thrombosis, embolism, cardiac failure, and urinary infection. Our series of twenty-eight cases were divided between private patients and those operated upon at the General Hospital. There were five deaths as follows: male, aged 58, nine days postoperatively of peritonitis and pneumonia following the partial necrosis of his colostomy loop; female, aged 63, twenty-six days postoperatively of spinal meningitis due to infection by the colon bacillus; male, aged 62, five days postoperatively of broncho-pneumonia; female, aged 52, sixteen days postoperatively from infarct of the lung followed by pneumonia; male, aged 46, three days postoperatively, cause not determined, and autopsy was refused.

It is a matter of opinion as to the percentage of cases which should be operated upon by this method. It depends somewhat upon the skill and experience of the individual surgeon. In our own practice during the past three years, in those patients we have accepted for radical operation, we have done the one-stage abdomino-perineal operation in 70.4 per cent of the cases.

In conclusion, I wish to state it is our opinion that, barring obstruction which cannot be relieved by medical means, any patient who can survive a two-stage procedure abdomino-perineal operation will tolerate a one-stage procedure as well, or better. The mortality rate should be less rather than more, he has his growth out earlier, he is saved the risk, pain and anxiety of a second operation, and his period of hospitalization and disability is less. There is a group of operable cases in which, because of physical impairments, no form of abdomino-perineal operation is advisable. The best procedure in these cases is a simple colostomy, followed later by a perineal excision of the rectum. In general, we have divided our cases into three groups: those suitable only for palliative measures, namely colostomy, fulguration, et cetera, those permitting colostomy and later perineal excision of the rectum, and those suitable for the one-stage abdomino-perineal operation.

Discussion

Dr. A. A. Zierold: It should be relatively easy to discuss a paper such as this because it always should be easy to talk about your troubles; but it is a little bit difficult to add, by way of discussion, anything to what has been said. I think everyone who is operating in and about the rectosigmoid has approached it with considerable trepidation. It is formidable surgery. To my mind, it is the most difficult surgery that we have to undertake and in many ways it is surprising why it should be so. Hemorrhage is not a great factor; we are not really concerned with bleeding, we are not really concerned with difficult anastomosis; we are oftentimes simply overborne by the amount of work there is to do in the resection of the rectosigmoid.

As far as I can determine, from what I have seen and more from what I have read, there is no question as to the worth and the advisability of an abdomino-perineal operation. It is the most complete operation that can be performed. It affords the patient the greatest protection, the greatest assurance against recurrence; and I think, as Dr. Fansler has said, that most people will come to the one-stage abdomino-perineal operation as the most desirable type of operation. However, I think that for most of us it is not a question of whether we should do the operation in one or two stages, but a question of accepting the one-stage abdomino-perineal operation or some lesser procedure, and I think that that is something that is sometimes overlooked in an effort to do what is the best thing for the patient without, perhaps, a careful inventory of our own capacity to do the necessary operation. I think that many times the patient would be better off with the lesser procedure than with the one-stage operation, but if the patient is of such type, so prepared that it is reasonable that he will withstand such an operation, there is no question but that it is the most desirable type.

Naturally, Dr. Fansler has spoken more in detail of the technic of surgery inasmuch as this is a surgical society. These people who have carcinomata of the rectosigmoid, I believe, require more careful preparation than almost any other type of individual. Dr. Fansler mentioned preparation by means of restoration of the hemoglobin, et cetera. I think many times we are too willing to accept, as was said, a hemoglobin of 50 or 60 and reassure ourselves a bit too readily by a simple transfusion. Many of these people are not only dehydrated, but are suffering from a food restriction and I believe that it isn't a question of one transfusion, but of multiple transfusions. These people need not only 500 or 600 c.c. of blood, but at times 1,000 or 2,000.

One thing that hasn't been stressed, although Dr. Fansler and I have talked about it previously, is the protein level in the debilitated patient. Many cases of rectal carcinoma, as a result of blood loss and restricted diet, will show a blood protein definitely below the normal level, enough below the normal level so that it constitutes a hazard not only to healing but to what is of equal importance, normal water metabolism. An individual with a plasmaprotein of 4 or 5 will not tolerate the same amount of fluid as a normal individual. This individual given 2,000 or 3,000 c.c. of fluid subcutaneously will develop edema in spite of anything that you do. The addition of chloride merely aggravates the condition.

Anesthesia, of course, is always a personal problem. As Dr. Fansler said, it is difficult for anyone to accomplish a one-stage abdomino-perineal excision with the ordinary novocaine spinal anesthesia. The anesthetic period is too short. One hesitates to reinforce it by a second spinal puncture, although I don't know whether this is a real hazard or not. This may be avoided by the use of metacaine, which gives a longer anesthetic period, but I do not believe that I would care to be confined to a given anesthetic time even with metacaine.

With regard to the technical procedure, I think Dr. Fansler might well emphasize the necessity for dissecting deep and separating the bowel much further than you think is ever going to be necessary, because it will probably never be too much and is often just about what is necessary to make the perineal operation simple and short.

The difficulty in closing the peritoneum, I would think, would be more of an apparent difficulty than an actual one if the dissection is begun by splitting the peritoneum high on the right side of the mesentery. There is always a long enough flap that can be carried over to the left side.

Like all operative procedures, this discussion could be carried on endlessly and perhaps with very little profit. It has been a pleasure to hear Dr. Fansler. I think he has had an excellent experience, I am sure as large as anyone here, and I think anyone who can present such a series and such a mortality is to be congratulated.

Dr. Lawrence Larson: Dr. Fansler deserves a great deal of credit for the manner in which he has presented his observations and the results he has obtained. Colon surgery is difficult, the mortality rate is high, and the end-results are not always too encouraging.

Several points in his paper are worthy of further emphasis. The first of these is that carcinoma of the rectum can only be cured by surgery, and if surgical cure is to be attempted, no half-way measures are permissible. There is ample evidence that malignant tumors of the rectum remain localized for a long period of time so that if adequate removal is accomplished, cure may be expected. It is with this in mind that operations involving wide excision of the growth, such as the combined abdomino-perineal resection method, are to be most highly recommended in the light of our present knowledge. This operation is comparable in its principles to wide resection of the lymphatics in carcinoma of the breast.

The greatest barrier to operability of rectal neoplasms is extension or metastasis of the growth, and that these tumors extend and metastasize late is a proved fact. In a series of 107 autopsies which I studied at the University of Minnesota, Department of Pathology, of rectal malignancies, about half died of the disease with either no extension or metastases, or with only a few regional glands involved. This is a fact of considerable significance since it gives encouragement in curing the disease even in a late stage if sufficiently wide resection can be done. Similar studies from surgical specimens show a frequent invasion of the regional glands but late distant metastases. Furthermore, many carcinomata, which at first observation seem inoperable because of extensive fixation to surrounding structures, in reality are operable. The fixation may be due mainly to inflammatory processes about the tumor. This is a commonly observed clinical fact and gives further encouragement in treating this disease. In addition, the size of the tumor has nothing to do with the degree of extension or metastases as shown by many studies, especially those of McVay.

All descriptions of the spread of carcinoma of the rectum indicate the most important is that in an upward direction along the course of the inferior mesenteric artery and thence laterally to the pelvic colon. Therefore, with this in mind, radical removal such as Dr. Fansler described definitely offers best opportunity for cure. Removal of the mesentery with its gland-bearing tissues even as high as that up to the sigmoid affords the best results.

Another factor to bear in mind is that rectal carcinoma is a rather common disease. In fact, about a third of all malignant tumors of the gastro-intestinal tract are in the colon, and more than half these cancers of the colon are in the rectum. It is because examination of the rectum can be easily and satisfactorily carried out by direct inspection or palpation, that, theoretically at least, we should diagnose these tumors at an earlier date, so that treatment could be more satisfactorily carried out. It goes without saying that much care should be taken in examining any individual who passes blood by rectum, or when there is an unexplained dyspepsia, weight loss, or change in bowel habits.

It seems trite to again emphasize preoperative preparation of these patients for surgery. However, if one is to widen the scope of this operation, there is only one way to make it applicable to a large number and that is to get these individuals in the best possible condition by a week or ten days of preparation. Obstruction can usually be relieved, the liver can be replenished with glycogen, any anemia improved and any cardiac or renal impairments treated. In this way, if two-thirds of the patients can be rendered operable, and if a mortality rate of 10 per cent or lower can be obtained, then we are approaching a satisfactory method of treating this disease.

Dr. Orwood J. Campbell: I have enjoyed Dr. Fansler's unusually lucid and commendable report of his experience with the one-stage abdomino-perineal resection. I want to say a word about what Dr. Fansler referred to as medical relief for obstruction.

For the past two years, I have been interested in the one-stage resection of carcinomas of the colon using an aseptic type of end-to-end anastomosis. Of course, this procedure cannot be done in the presence of any obstruction whatever. I have been surprised and gratified to learn how effectively incomplete obstruction can be relieved by placing the patient on the so-called nonresidue diet and giving large quantities of mineral oil orally.

I have had one case in which complete obstruction of the bowel was established due to a carcinoma of the sigmoid. X-rays revealed enormous gaseous distension of the ascending and transverse colon, with the descending colon distended and packed solidly with fecal material. The patient was in poor condition and during the several days which it took to get him into shape large quantities of mineral oil were administered, from 4 to 6 ounces per day. We had despaired of relieving him and on the 7th day prepared to do a colostomy. The obstruction was suddenly relieved and he passed large quantities of liquid feces. At the end of a three week period his condition was excellent and he was operated upon without any evidence of his previous obstruction. A single-stage resection with end-to-end anastomosis was done and he made a very satisfactory convalescence.

I think, if an effort is made to decompress an obstructed bowel "medically," considerable time may be required. While I do not recommend the attempt to relieve all cases of complete obstruction without preliminary colostomy or cecostomy procedures, it has been surprising to learn how effectively this relief can be obtained in many cases.

REPORT ON THE USE OF ROENTGEN RAYS FOR CONTRACEPTION

In 1932 Harris (Am. J. Roentgenol., 27:415, (March) 1932) and in 1936 Mayer, Harris and Wimpfheimer (J. Obst. and Gynec., 32:945, (Dec.) 1936) published articles dealing with the use of roentgen rays to produce therapeutic abortion. Their results were satisfactory, and they advocated this method as particularly desirable in cases in which surgery is hazardous or contraindicated for medical reasons. At the organization meeting of the Council's Committee on Contraceptives, it was suggested that roentgen rays had been used to cause sterility in women or to interrupt pregnancy for nonmedical reasons. Dr. A. U. Desjardins, in an effort to determine how extensively roentgen rays are being used for these purposes, wrote to twelve radiologists throughout the country. In all but one instance the replies from these men stated that they were not aware of such a practice, certainly on the part of reputable members of the profession, and were doubtful whether this technic was being employed to any appreciable extent by less scrupulous practitioners. (J.A.M.A., Nov. 5, 1938, p. 1767.)

BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

SURGICAL PATHOLOGY OF THE DISEASES OF THE MOUTH AND JAW. A. E. Hertzler, M.D. Surgeon to the Agnes Hertzler Memorial Hospital, Halstead, Kansas; Professor of Surgery, University of Kansas. 248 pages. Illus. Price, $5.00, cloth. Philadelphia: J. B. Lippincott Co., 1938.

A MANUAL OF FRACTURES AND DISLOCATIONS. Barbara Bartlett Stimson, A.B., M.D., Med.Sc.D., F.A.C.S. Assistant in Surgery, College of Physicians and Surgeons, Columbia University, New York City; Assistant Attending Surgeon to Presbyterian Hospital, New York. 214 pages. Illus. Price, $2.75, flexible binding. Philadelphia: Lea & Febiger, 1939.

PRINCIPLES OF HEMATOLOGY. Russell L. Haden, M.A., M.D. Chief of Medical Division of Cleveland Clinic; formerly Professor of Experimental Medicine, University of Kansas School of Medicine, Kansas City, Kansas. 348 pages. Illus. Price, $4.50, cloth. Philadelphia: Lea & Febiger, 1939.

SURGICAL TREATMENT OF HAND AND FOREARM INFECTIONS. A. C. J. Brickel, A.B., M.D. Departments of Anatomy and Surgery, Western Reserve University. 300 pages. Illus. Price, $7.50, cloth. St. Louis: C. V. Mosby Co., 1939.

TRAUMA AND INTERNAL DISEASE. Frank W. Spicer, A.B., M. D., F.A.C.P. 593 pages. Illus. Price, $7.00 cloth. Philadelphia: J. B. Lippincott Co., 1939.

ANNUAL REPORT OF THE SURGEON GENERAL OF THE PUBLIC HEALTH SERVICE OF THE UNITED STATES for Fiscal Year 1938. 184 pages. Illus. Price, 60c, cloth. Washington, D. C.: Government Printing Office, 1938.

PROCEEDINGS OF THE THIRTY-SECOND ANNUAL CONVENTION OF THE ASSOCIATION OF THE LIFE INSURANCE PRESIDENTS. 239 pages. Paper cover. New York: Association of Life Insurance Presidents, 1939.

AMERICAN ILLUSTRATED MEDICAL DICTIONARY. 18th ed. W. B. Saunders Co., 1938. 1607 pages. Illus. $7.50. Philadelphia.

This new, revised edition brings up to date a standard dictionary which has always been a popular and helpful reference book. New terms have been added and many old definitions have been revised so that the book keeps up with the advances in medical science. Modernization of spelling, such as changing sulph- to sulf-, has been made and such new terms as sulfanila-

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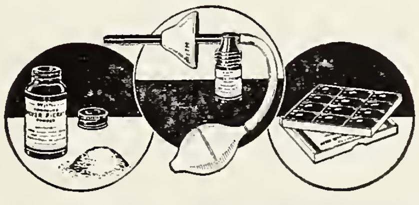

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mide have been added. The listing of proper names given to signs, diseases, glands, tests, under those general headings, aids in quickly finding the descriptions, especially if one is uncertain of the spelling. The derivations are not as fully or clearly given as they might be, but on the whole they are adequate.

Little change has been made in the arrangement of the book, the illustrations being scattered through the text and such tables as weights and measures being kept in their alphabetic place in the text. The Posologic and Therapeutic Table at the end of the alphabet has been changed to A Table of Dose in Both Apothecaries' and Metric System. By adding many more drugs and omitting the column "Action and Uses" this table is made more useful for quick verification of dosage.

As is true in nearly all dictionaries, some terms are omitted, and some definitions are not clear, but the fact that this reference tool has been so carefully revised and brought up to date compensates for the few disappointments it causes.

I. A.

THE HEART IN PREGNANCY. Julius Jensen, Assistant Professor of Clinical Medicine, Washington University School of Medicine, 371 pages. St. Louis; The C. V. Mosby Company, 1938.

In the book, *The Heart in Pregnancy,* Jensen has very ably gathered together all the information which is available in the literature relative to the heart and pregnancy. To this, he has added his own experiences which he has had in the St. Louis Maternity Hospital.

It may be interesting to know that Doctor Jensen secured some of his postgraduate work as a Fellow in Medicine in the University Hospitals at the University of Minnesota.

This book has been compiled so that the cream of the various subjects can quickly be digested, and, if a thorough knowledge of the subject is desired, one may obtain it by reading the whole.

The first section of the book considers the effect of pregnancy on the normal heart. He discusses the various theories, investigations and facts which have been presented to the medical profession on this subject in the past. One fact is striking and that is the relatively little valuable knowledge which we have regarding the heart and cyesis.

Jensen points out that there are many theories regarding various subjects by which we presume that there is an increased amount of work by the heart during pregnancy. Subjects such as an increased pulse rate, peripheral resistance, oxygen utilization, circulation time, cardiac output, et cetera, are still too little developed to be reliable. However, the most reliable information he believes is the increase in metabolism and the increased volume of the circulating blood which may be out of proportion to the increase in weight. He stresses the point that with the development of the x-ray, many new problems have been added to this question and few, if any, have been solved.

In the second section he discusses the abnormal cardiac impulse formation during childbearing such as tachycardia, brachycardia, extra systoles, auricular flutter and heart block.

The last section deals with organic heart disease and pregnancy. All angles of this extensive subject are presented and discussed. The importance of the relationship of heart disease to maternal mortality is a most serious matter and he very thoroughly presents all available information on this subject. He states that, "Heart disease ranks amongst the four or five most important causes of maternal death. It accounts, probably, for some seven per cent of all fatalities and claims close to 1,000 women per year in the United States," and, furthermore, "A death rate of 2-3 per cent appears to be irreducible at present, which means that the complication of heart disease and pregnancy carries a death rate at least three times as great as the present gross maternal death rate in the United States."

The chapters on the management of pregnancy in rheumatic heart diseases and the obstetrical delivery of cardiac patients are excellent and exhaustive.

Probably one of the most valuable parts of this book is his discussion of the relationship between eclampsia and permanent kidney damage, and the relationship between the so-called toxemias (with hypertension) and cardiovascular disease.

An extensive bibliography is also added to this book.

This treatise is so all inclusive that it becomes an invaluable aide to any one who practices obstetrics or cardiology, and I should like to add my personal gratitude to Doctor Jensen for the tremendous amount of work which must have been done to complete this study.—EUGENE M. KASPER, M.D.

DOCTORS, I SALUTE. Emilie Conklin. Price, $1.50. Light and Life Press, Winona Lake, Indiana.

A small volume of poems by the author, a few written on subjects allied to medicine; the majority on a variety of subjects.

As one reviewer said: "The volume seems to contain with few exceptions tributes in verse, rather than real poetic expressions. She (the author) seems to have said all she has to say about doctors in the first one entitled, "Doctors, I Salute!" Very little authentic emotion is evidenced in most of the others. What she tried to do, probably, was to dedicate a poem to each type of medical practitioner. That, I think, was a mistake. No one person could get all those different points of view well enough to have any feeling about them. . . . There are some lovely lines in "A Call to Service." "To Try on a Wall" is attractive.

To compare the author with Rudyard Kipling as was done by some reviewers, is in our opinion unjustified.—C.B.D.

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THE "POSITION-RELIEF SYNDROME" OF HYDRONEPHROSIS*

JOHN M. BERKMAN, M.D., and JAMES T. PRIESTLEY, M.D.

Rochester, Minnesota

IN THE past decades innumerable laboratory procedures have been developed to augment the accuracy of clinical diagnosis. As a result, the detection of numerous organic diseases has been greatly facilitated and diagnoses, previously made largely by conjecture, can now be established with certainty. This remarkable development of mechanical devices has not been without its ill effects, however, as frequently we physicians may unconsciously practice "laboratory medicine" without giving sufficient time and consideration to careful study of the patient himself. This trend in diagnosis is well illustrated by the comparatively few articles dealing with clinical symptoms, syndromes, and observations made by physical examination that appear in the current medical literature. No amount of laboratory tests can ever supplant a carefully taken history and a thorough physical examination, although both are of course essential to the practice of good medicine.

Although a urologic diagnosis is ultimately made by the urologist, in some cases the internist plays an equally important part by his recognition of symptoms which to him suggest urologic disease. As a rule the internist's reasons for advising urologic investigations are based on the following three groups of factors: (1) gross hematuria, symptoms of vesical irritation, a mass or pain in the renal region referred to the region of the bladder and testes, and other symptoms which immediately suggest the advisability of cystoscopy or intravenous urography; (2) abnormal findings in the urine or roentgenographic evidence which suggests the possibility of urologic disease, or (3) atypical abdominal pain which has not been satisfactorily explained by the usual gastro-intestinal investigations, in which case urologic investigation is usually carried out only to make the examination complete. Such complete investigation is for various reasons frequently omitted.

Patients who consult numerous physicians because of abdominal pain or disgestive symptoms which cannot be definitely attributed to a given organ may sometimes be subjected to unnecessary operation, and finally they are considered to be neurasthenic and thereafter all symptoms are explained on this basis. Certain patients who have hydronephrosis are in this category. It is often well to remember, however, that the neurotic patient who presents a rather bizarre clinical story may have organic disease in addition to his nervous instability.

Lesions of the kidney which manifest themselves by definite urologic signs or symptoms afford little difficulty in diagnosis. Some patients who have an uninfected hydronephrosis, however, present none of the usual symptoms or findings, and in addition urinalysis and a plain reontgenogram of the kidneys, ureters, and bladder reveal no abnormality. These patients have usually had various diagnoses made and have received numerous forms of treatment without relief. In all probability the two factors primarily responsible for incorrect diagnosis have been failure to suspect the kidney because of an inadequate or unappreciated history and the opinion that a negative urinalysis and normal plain roentgenogram of the urinary tract exclude urologic disease. In cases of hydronephrosis other than those in which the kidney or renal pelvis is very large, it is very unusual to obtain diagnostic information from roentgenograms of the kidneys, ureters, and bladder without the use of a contrast medium. Likewise, if no infection is present urinalysis reveals no abnormality.

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*From the Division of Medicine (Berkman) and the Division of Surgery (Priestley) of the Mayo Clinic, Rochester, Minnesota.

Since 1932 we have paid particular attention to a group of symptoms experienced by certain patients who have hydronephrosis which we have chosen to designate as the "position-relief syndrome." This syndrome is not presented with the purpose of advancing a new method by which an unquestioned clinical diagnosis of hydronephrosis may be made without further urologic investigation, but rather to call attention to a group of associated symptoms, heretofore not emphasized,* which in the absence of suggestive clinical and laboratory findings have shown themselves to be of very definite value in leading to a diagnosis of hydronephrosis. The patients observed in this clinic in whom elicitation of the position-relief syndrome has led to a diagnosis of hydronephrosis without exhaustive eliminating investigations have all had unilateral hydronephrosis caused by intermittent ureteral obstruction situated in the region of the ureteropelvic juncture.

The pain experienced by these patients is as a rule dull and aching. It is situated anteriorly in the upper part of the abdomen on the side of the involved kidney. The pain is usually not referred to the lumbar region or down to the region of the bladder or testes. This pain, or dull ache as it is usually described, is not definitely localized in the renal region but occurs in the entire upper portion of the abdomen. It may be more or less constant for several days, but it is usually present for a few hours or a day or two at a time and disappears only to recur at a later date.

Walking or standing in the erect position for a period of time considerably aggravates the pain. It is of interest to note that these patients as a rule awaken in the morning free from pain. After being up for several hours they may have a recurrence of the pain; however, most of their discomfort occurs later on during the day. Most of the attacks come on after a day's work and last throughout the evening. Definite relief is obtained by reclining. In the majority of instances more relief is obtained by lying on the back than on the affected side, and most relief is obtained by lying on the side opposite the affected kidney. In some instances patients have learned that attacks can be aborted by lying on the opposite side. In a very small number of cases** patients have obtained relief by lying on the affected side, more relief being obtained in this position than when lying on the side opposite the affected kidney, the latter position having increased the pain and caused a sensation of a heavy weight sagging down from the affected side. In these few cases this has been the only deviation from the described syndrome. Some patients have found that lying on the back with the arm on the affected side flexed under the lumbar region gives relief. Most of them, however, give a history of obtaining relief by lying on the unaffected side with a pillow placed under the lumbar region.

It should be emphasized that obtaining a history of the position-relief syndrome is not a simple matter and requires considerably more time and care than recording the usual history. Patients do not voluntarily offer this information, for in their opinion it is of no significance; consequently, careful interrogation regarding the postural relationships of their pain is important. Most of these patients have suffered for a period of two years or more and constant aggravation has lowered the threshold to pain to such a degree that they may appear as chronic complainers and such a diagnosis as neurosis or chronic nervous exhaustion may seem justifiable.

The accompanying reflex gastro-intestinal symptoms of loss of appetite and nausea also may appear to be neurotic in character. These two symptoms are very common. Loss of appetite may be rather marked, at times reaching such a point that very few foods are tolerated, resulting in considerable loss of weight. Nausea may occur periodically and last from a few moments to an hour or so, or in some instances it may be almost constantly present. It may recur without apparent reason several times daily, and it appears to have no relation whatsoever to the presence or absence of pain. While vomiting occurs, it is not nearly so frequent a symptom as loss of appetite and nausea. It is always associated with an increase in the severity of pain and usually is present only in the more severe attacks.

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*It is common knowledge that patients with some diseases are more comfortable in certain positions than in others; however, we have been unable to find any record of this fact having been applied practically in the diagnosis of hydronephrosis.

**Several such cases of hydronephrosis were seen prior to the time when it was appreciated that the position-relief syndrome was common to many cases of hydronephrosis. We have no record of some of these early cases; however, we have a record of sixteen patients who gave a definite and unmistakable history of the syndrome. Two of these patients obtained relief by lying on the affected side.

Every patient who presents a history which suggests the position-relief syndrome will not have hydronephrosis; consequently, a certain number of unnecessary intravenous urograms may be made. The trouble and expense involved in cases of this type, however, are entirely compensated for by the discovery of a definite hydronephrosis in other cases. Early diagnosis by intravenous urography is most desirable, as then the kidney can usually be preserved. One should remember that ureteral catheterization in the presence of an intermittent obstruction at the ureteropelvic juncture may occasionally precipitate an acute obstruction which will require immediate surgical attention, especially if any infection is present.

The treatment of patients who have unilateral hydronephrosis of the type under consideration is primarily surgical. Whether a conservative operation on the renal pelvis and ureter is feasible or whether nephrectomy is necessary depends on the nature and extent of the lesion and the condition of the other kidney. Whenever possible, nephrectomy is avoided; however, in some instances the extensive damage of the involved kidney leaves no alternative. Commonly there is incomplete drainage from the renal pelvis which is caused by abnormal insertion of the ureter into the pelvis, narrowing of the lumen of the ureteropelvic juncture by fibrosis and thickening in the tissues in this region, compression of the ureter by anomalous vessels or fibrous bands, or possibly, physiologic abnormalities in the neuromuscular mechanisms which normally effect complete emptying of the renal pelvis. Depending on the nature of the lesion present the exact type of plastic operation most suitable for a given case will vary. These various surgical procedures will not be discussed at this time except to say that, when properly performed in well selected cases, quite satisfactory results may be anticipated.

A few illustrative cases are presented to indicate more clearly the value of the position-relief syndrome in establishing the diagnosis of hydronephrosis.

Cases Illustrating the Position-relief Syndrome

Case 1.—A woman, aged twenty-one years, registered at the clinic November 6, 1934, complaining of periodic, dull aching pain and tenderness in the left upper quadrant of the abdomen and momentary waves of nausea of four years' duration. She had experienced considerable gaseous indigestion associated with belching. Appendectomy had been performed, elsewhere, in June, 1933, without relief of symptoms. The pain usually lasted about two days, disappeared at night, and was followed by residual tenderness for two or three days. This distress was aggravated when the patient was on her feet, and she had discovered that definite relief could be obtained by reclining and that the pain disappeared within an hour or so after she lay on her right side with a pillow under her lower ribs, so that her left side was arched. Attacks of pain had occurred every three to six months, but had increased in frequency recently. There had been no fever, chills, or vesical symptoms.

On physical examination at the clinic the patient appeared healthy and examination gave essentially negative results except for slight tenderness in the epigastrium. Microscopic examination of a catheterized specimen of urine was entirely negative. Roentgenologic examination of the kidneys, ureters, and bladder without an opaque medium disclosed nothing abnormal. Because of the character of the distress, and in spite of the normal urinary findings, an intravenous urogram was made which disclosed hydronephrosis of the left kidney, grade 2 to 3, caused apparently by obstruction at the ureteropelvic juncture (Fig. 1). The right kidney was normal, and there was only slight reduction of function in the left kidney.

At the time of operation the left kidney appeared to be in good condition except for dilatation of the pelvis, grade 2 plus. The extrarenal pelvis was large and the ureter came off fairly dependently at the side of the pelvis closest to the vertebral column. There was no demonstrable cause for obstruction at the ureteropelvic juncture, which admitted a No. 10 French soft-rubber catheter without difficulty. A wedge-shaped area of the dependent portion of renal pelvis situated between the renal parenchyma and ureter was excised so that the ureter left the pelvis dependently and close to the kidney itself.

Following operation this patient was entirely free from symptoms for one year. At the end of that time she experienced pain over the left renal region which lasted for a period of ten days. This was associated with pus in the urine. Following marriage and pregnancy, pus was again found in the urine; however, no pain was experienced. Following delivery she felt very well, and she has been able to take care of her household duties without help and has had no pain whatsoever.

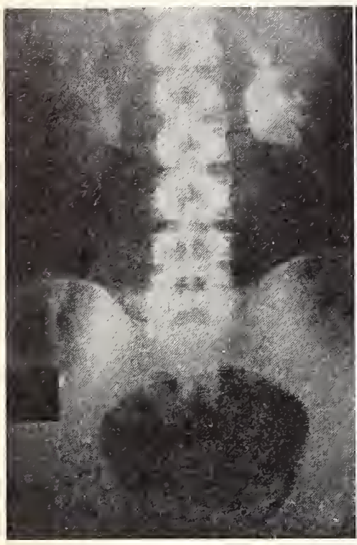

Fig. 1. (Case 1) Intravenous urogram, showing left hydronephrosis.

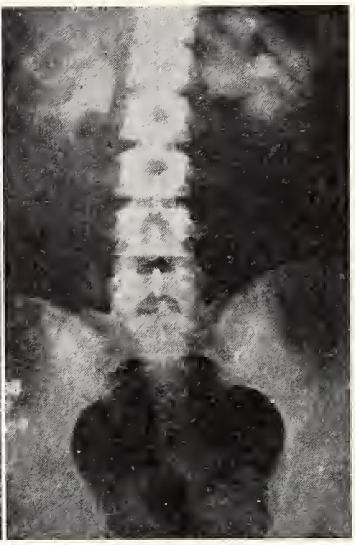

Fig. 2. (Case 2) Intravenous urogram, showing left hydronephrosis.

Case 2.—A woman, aged thirty years, came to the clinic in October, 1935, complaining of attacks of pain in the left upper abdominal quadrant of three years' duration. At first the pain had occurred at intervals of every two months and had lasted for a period of two days; however, during the previous year the attacks had occurred more frequently. The pain was dull and aching and would increase in severity for several hours, then gradually decrease and finally disappear. The attacks usually occurred in the afternoon. Numerous examinations failed to explain the pain, and the patient had been advised to take a vacation for two months, during which time she had two attacks. On returning to work, the attacks became more and more frequent and the severity of the pain increased. At this time with some attacks she began to experience nausea and vomited. Shortly before coming to the clinic the pain was present approximately five days out of each week and lasted two or three hours each time it occurred. At times the attacks occurred late in the morning, but more often in the afternoon, usually disappearing during the evening. There had been some loss of appetite, and gaseous indigestion had been a bothersome symptom; however, no loss of weight had occurred.

Careful questioning revealed that the patient obtained relief on reclining; lying on her back or her right side had aborted a number of attacks. She had found it impossible to lie on her left side as this position definitely increased the pain.

Physical examination and laboratory tests, including urinalysis and roentgenograms of the kidneys, ureters, and bladder, gave negative results. An intravenous urogram revealed left hydronephrosis, grade 3, which was considered to be secondary to obstruction at the ureteropelvic juncture (Fig. 2).

At operation the kidney appeared to be normal except for enlargement of the renal pelvis, grade 3. Several anomalous vessels ran to the lower pole of this kidney and pressed on the ureteropelvic juncture, thereby constricting the lumen of the upper portion of the ureter. The pelvis was of the square-shaped type, the ureter coming off at the medial dependent portion so that it was located a considerable distance from the lower pole of the kidney. After temporary constriction of the anomalous vessels, which did not demonstrate any marked circulatory changes in the lower pole of the kidney, the vessels were severed. A wedge-shaped portion of the lower part of the pelvis situated between the ureter and lower pole of the kidney was excised. This patient has had no symptoms whatsoever since surgery.

Case 3.—A woman, aged sixty-one years, registered at the clinic December 21, 1934, complaining of weakness, gaseous indigestion, and dull pain in the right half of the abdomen. The pain had occurred first about two years previously and had recurred periodically since then. It was referred sometimes to the region of the right scapula and occasionally was rather severe. Weakness had gradually supervened and the pain had become constant. Gaseous indigestion had become more pronounced and was especially troublesome after eating. Roentgenograms of the stomach and gallbladder had been made, elsewhere, and the patient had been told that she was suffering from disease of the gallbladder and was advised to undergo cholecystectomy.

Careful questioning elicited the fact that the pain was definitely affected by variations in posture. It was aggravated when the patient walked or was on her feet for any length of time. Lying on the back or right side gave her some relief, but lying on the left side gave considerably more relief. There had been no vesical symptoms, fever, chills, or jaundice at any time.

Physical examination was essentially negative except for obesity. Urinalysis was negative. Roentgenologic examination of the gallbladder disclosed that it was functioning poorly and contained stones. A roentgenogram of the kidneys, ureters, and bladder revealed no gross abnormality. Because of the definite postural relationship of the pain, and in spite of the negative urinalysis, negative roentgenogram of the kidneys, ureters, and bladder, and positive evidence of a diseased gallbladder containing stones, which could easily be accepted as the explanation of her symptoms, urologic investigation was carried out.

An intravenous urogram revealed a normal left kidney, and hydronephrosis, grade 2, of the right kidney. Cystoscopy and retrograde pyelography demonstrated marked stasis in the right renal pelvis, apparently due to obstruction at the ureteropelvic juncture (Fig. 3). Interestingly enough, following cystoscopic examination the patient had a slight reaction characterized by pain and fever. This responded promptly, however, to drainage of the right kidney with an indwelling ureteral catheter. The patient stated that the pain she had during this period was identical to that which she had experienced previously.

Operation revealed a small kidney firmly imbedded in inflammatory perirenal tissues. Marked pyelectasis and caliectasis were present, and the cortical surface of the kidney showed evidence of considerable infection. Because the patient was sixty-one years of age and the opposite kidney was normal, and because of the infection and extensive renal damage, nephrectomy was performed. The pathologist reported diffuse pyonephritis and multiple depressed scars on the cortex. The ureteropelvic juncture had been compressed by bands of fibrous tissue. It was estimated that 60 per cent of the kidney was destroyed. Following operation the pain entirely disappeared. The gastro-intestinal symptoms, however, did not improve. Two years later, cholecystostomy was performed and stones were removed from the gallbladder.

The following case is reported as an example of the small group of cases previously mentioned in which patients obtained relief by lying on the affected rather than on the unaffected side:

Case 4.—A woman, aged forty-nine years, came to the clinic in January, 1937, complaining of attacks of pain in the right side of the abdomen which had been present for a period of two years. At times, the pain had been referred through to the back. At first the attacks had occurred periodically and infrequently; however, in the year preceding admission they had occurred more frequently, and for the previous six months the pain had been almost constant. In this period of two years the patient had experienced periods of nausea, but these had had no relation to the presence or absence of pain. At first, nausea might be absent for a week or two at a time and then be followed by several attacks of nausea daily. In the year preceding admission these attacks of nausea had become more frequent and had occurred each day, and in the last six months the nausea had been almost constant. Loss of appetite was marked, and there had been an associated loss of weight amounting to 30 pounds (13.6 kg.). Because of the gastro-intestinal symptoms the patient had during these two years markedly limited her diet and for a few months preceding admission had eaten only soup. Vomiting occurred only when the pain was very severe. Various diagnoses had been made, one of which was appendicitis.

Careful questioning revealed that the patient had rarely awakened with pain in the morning. After being up for a time pain occurred, and she could obtain relief by reclining. While some relief was experienced when she lay on her back, most relief was obtained when she lay on her right side. She had made a small, square, thick pillow which she always placed under the right lumbar region. Lying on her left side always increased the pain and caused a sensation as though something heavy were sagging from her right side.

Physical examination was negative, as were laboratory tests, including examination of the urine and roentgenograms of the kidneys, ureters, and bladder. Urologic investigation revealed right hydronephrosis, grade 3, with obstruction at the ureteropelvic juncture (Fig. 4). At the time of cystoscopy 110 c.c. of residual urine was aspirated from the right renal pelvis.

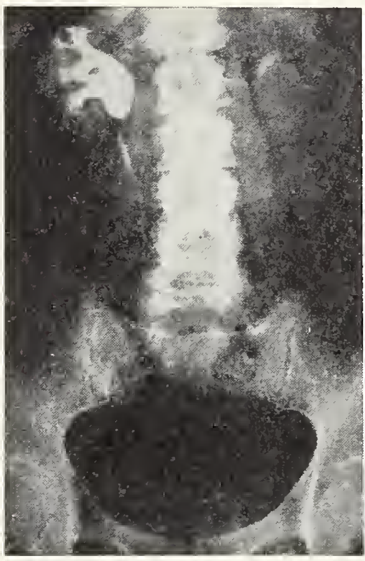

Fig. 3. (Case 3) Right retrograde pyelogram, showing hydronephrosis. (Retrograde pyelogram was made soon after an intravenous urogram.)

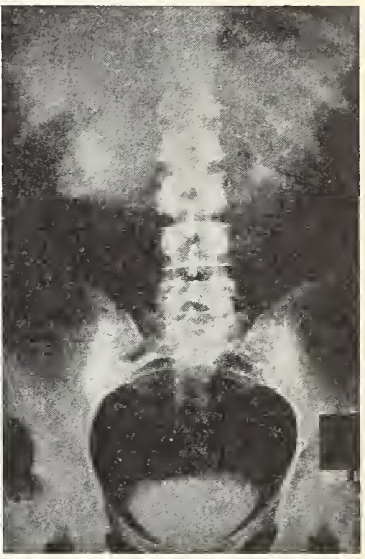

Fig. 4. (Case 4) Right retrograde pyelogram, showing marked hydronephrosis. (This pyelogram was made soon after an intravenous urogram, which showed diminished function of the right kidney.)

Operation revealed edema in the perirenal tissues and a large flabby-appearing kidney with a distended extrarenal pelvis the size of an orange. Dilatation of the calices had resulted in considerable thinning of the renal parenchyma. Hydronephrosis was associated with anomalous vessels running to the lower pole of the kidney. Nephrectomy was performed and the pathologist reported destruction of 50 per cent of the renal parenchyma.

The patient's convalescence was uneventful, and within a week from the time of operation she had a better appetite and ate more at each meal than she had at any time in the previous two years. The gastro-intestinal symptoms have entirely disappeared.

Summary

A certain group of patients who have uninfected hydronephrosis consult the physican because of abdominal pain which at first does not seem typical of any given organic disease. Urinalysis and a plain roentgenogram of the kidneys, ureters, and bladder reveal nothing abnormal. Careful questioning of the patient, however, elicits certain postural relationships of the pain to which the term "position-relief syndrome" has been applied. Anorexia and nausea are common associated symptoms.

This syndrome should, at once, arouse suspicion of hydronephrosis and indicate the necessity of urologic investigation. In most instances intravenous urography offers a very satisfactory method of diagnosis. Treatment is primarily surgical, and early diagnosis is most important before renal damage has become extensive, as this enhances the feasibility of a conservative operation and makes possible preservation of the kidney. If the disease is advanced, nephrectomy may be necessary. Four illustrative cases are presented.

WHY MEN KILL

Half the homicides committed in the United States arise over some trifling incident. This is the conclusion reached by a study of 500 homicides reported to the Metropolitan Life Insurance Company among a group of its policyholders. It may well be assumed that the same proportion applies to the total of about 10,000 homicides reported annually for the United States as a whole.

The information regarding the circumstances attending the 500 homicides covered by the present study has been obtained from such sources as reports of coroners' inquests, statements of insurance investigators, and newspaper clippings.

A great variety of situations—for the most part, absurdly trivial quarrels—led up to these misfortunes. Chief among these were disputes concerning domestic or family affairs: An irate husband beats and kills his wife because his dinner is not ready on time; a drunken youth shoots his mother for remonstrating with him about his drinking to excess; a man shoots a friend after an argument over being the last to be served a glass of beer in a neighbor's home. No less than 11.6 per cent of all the slayings follow domestic quarrels about no more serious affairs than these.

The second important occasion of quarrels leading to homicide involves money or property, usually of little value—sometimes no more than 25 cents. In still other instances, quarrels arise because of insulting remarks or personal affronts, gambling differences, or other situations that create a burst of hatred or anger. Typical incidents of this kind are the following: A lunchroom proprietor shoots a customer after an argument over the quality of a sandwich; a man is beaten and killed following a quarrel developing from a person's accidentally stepping on another's foot; a man slashes another because they quarrel about who shall play a mechanical nickelodian first. In a considerable number of these cases the abuse of alcohol is mentioned. Out of the 250 killings resulting from quarrels, in 116 cases either the slayer, the victim, or both had been drinking.

In connection with the homicides arising from jealousy or thwarted love, it is interesting to note that the beloved, and not the love rival, is more often the victim. Fifty-three persons were slain thus, as against 35 slain by their rivals in a love affair. In this type of homicide the slayer commonly commits suicide. In fact, one-fourth of the slayers who were classed as aggressors in the slaying of husband, wife, or lover ended their own lives also.

Homicides arising out of or during crimes of violence—robberies, burglaries, or jail breaks—account for 80 victims in this experience, or 16 per cent of the total number. Unfortunately, the officers of the law and law-abiding citizens are the victims more often than the criminals. Of 43 persons who died at the hands of felons, 6 were police officers; 15 were going about their work as watchmen, gasoline station operators, tradesmen, etc.; and the remaining 22 were other law-abiding citizens. The number of felons slain was 37, of whom 33 were killed by law officers and four by their intended victims.

Spectacular murders by gangsters constitute a lower percentage of the total than we should be led to expect from the publicity given to them. Only 14 of the 500 slayings, or under 3 per cent, fell into this class. These murders occur in connection with rackets involving the dope traffic, labor disputes, and lotteries, and usually arise from rivalry between gangs or the attempt of one gang to break into the territory of another.

Ten persons were killed in attempting to evade arrest for trespassing or for disturbing the peace. Eight were killed for revenge on account of personal grudges of long standing or from a desire to even scores against informers. Insane persons committed 14 slayings, of which six took place in institutions. In 11 cases no motive for the slaying was apparent: the slayer was crazed with liquor and had no particular enmity against nor quarrel with his victim. Apparently, at the moment, he merely wanted to kill. Of the three cases that are classified as due to miscellaneous causes, two involved sex offenses, and in one case the slayer killed his wife in despair over financial troubles.

Criminal abortions, of which there were 22 fatal cases, are included here to conform with the current international practice of statistical offices, which list this cause of death with homicides.

This review of 500 recent homicides brings out strikingly that practically all killings arise under the stress of emotions of fear, hatred, anger, jealousy, or greed. And, absurd as it may seem, by far the majority are due to disputes or quarrels about trifles. Surely under such conditions it should be possible to reduce the number of homicides to the point reached in other civilized countries.—*Statistical Bulletin, Metropolitan Life Ins. Co.*, January, 1939.

TREATMENT OF CHRONIC SUPPURATIVE DISEASE OF THE LUNG*

THOMAS J. KINSELLA, M.D.

Clinical Assistant Professor of Surgery, University of Minnesota Medical School

Minneapolis, Minnesota

THE term, chronic suppurative disease of the lung, is here used to include those more or less chronic, non-tuberculous, suppurative processes within the lung, included under the terms pulmonary abscess, pulmonary gangrene, pulmonary infarct, bronchiectasis, and, in addition, the chronic suppuration now being recognized with increasing frequency in the course of pulmonary tuberculosis secondary to bronchial stenosis and frequently inappropriately called tuberculous bronchiectasis. This group embraces a number of conditions which may be not only distressing, debilitating and very disabling to the patient but even quite annoying to his associates because of the foul sputum expectorated. Their course, complications, prognosis and treatment are not always thoroughly understood by specialists, and even much less so by the general profession who are called upon to treat so many of these patients. In general, taken by and large, they are not well handled. This presentation is made, not in the hope of answering all problems involved, for many are as yet unsolved, but rather to present some of the things we know about their care and the contributions which modern thoracic surgery has made towards their adequate treatment.

Pulmonary Abscess

There is always considerable confusion concerning the proper use of the terms pulmonary abscess and pulmonary gangrene, and as to when a plain pulmonary abscess becomes a gangrenous abscess. Perhaps the use of the terms non-putrid and putrid abscess might be less confusing, but even here no sharp lines can be drawn. The term gangrene is properly applied to a destructive process within the lung in which there is an associated group of various anaërobic organisms of the fusospirochetal group which produce the putrid odor characteristic of such conditions. The presence of such an odor is indicative of inadequate drainage and the presence of devitalized tissue or fibrin within the involved area. Following the removal of this material the odor from the abscess promptly subsides.

There is still much discussion as to whether pulmonary abscess occurs as a result of aspiration of material from the mouth or the lodgment of septic emboli in the lung field. This problem cannot be answered categorically but I believe it is only fair to state that it may develop in either way. Experimentally it is very difficult in normal animals to produce a lung abscess by injection of foreign material into the bronchial tree directly. The cough reflex is the protective mechanism of the lung which prevents such a development. It is quite evident that if an abscess is to be developed in this way there must be not only aspiration of septic material from the mouth or throat but there must likewise be some disturbance of this protective mechanism to permit retention of this material and obstruction of a portion of the bronchial tree before an abscess will develop. On the other hand, it is very easy, experimentally, to induce suppuration of the lung by the injection of septic material into a vein, from which it is carried to the lung, producing a small infarct in which the organisms may grow, producing the destruction characteristic of lung abscess. Clinically it seems evident that abscess within the lung in the human may be produced by both mechanisms. The abscess complicating a retained foreign body in the lung is an example of the first. A pulmonary abscess complicating an operation on a peripheral septic area is a good example of the second type.

Treatment.—While surgically we are more or less concerned with the more chronic stages of the process, a few remarks on the treatment of the earlier stages may not be amiss. The adequate use of bed rest, supportive measures, transfusion, maintenance of adequate nutrition and so forth cannot be stressed too strongly. The lung possesses marvelous powers of repair if it can be adequately drained and relieved of the offending material. The above mentioned measures may be expected to be followed by spontaneous evacuation and healing in a fair percentage of instances. Medications of various types may be of some value, particularly expectorants, sedatives to control excessive cough but not to suppress the cough reflex. Antipyretics, analgesics and so forth may also add to the patient's comfort. Arsenic and bismuth injections have been used rather extensively in the hope of destroying the causative organisms, thereby healing the abscess. These drugs may have some value in helping to control the odor by killing the putrefactive organism present, but unless the abscess is drained adequately and the dead tissue removed the odor will recur. Sulphanilamide may be of some value if streptococci predominate. They should not be considered as curative drugs in this condition.

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*Presented before the Southern Minnesota Medical Association, Rochester, Minnesota, September 29, 1938.

Postural drainage has a definite and valued place in the treatment of various pulmonary diseases, but it must be used intelligently and not merely as a routine. Unless an abscess is draining through a bronchus, and that fairly freely, it is foolish to expect postural drainage to help the situation. Many a patient desperately ill with suppuration within the lung has been needlessly subjected to postural drainage when the abscess did not as yet have a communication with an open bronchus. Postural drainage only utilizes gravity in the drainage of an unfavorably located abscess through its communicating bronchus, which means turning the patient to such a position that the opening of the draining bronchus is at the bottom of the abscess cavity so that the pus may enter it and be coughed up. By the same token it is folly to utilize postural drainage when preceded by large doses of opiates which render the cough reflex inoperative. This not only interferes with adequate drainage but may predispose to aspiration and retention of septic material in other areas of the lung.

Bronchoscopic Examination and Aspiration.—It is not my province to attempt to discuss bronchoscopic treatment of pulmonary suppuration. A few points, however, are pertinent. It should not be done immediately but rather delayed until an abscess wall has formed and the abscess localized, a phenomenon which usually occurs in about three weeks. If no results are obtained after two or three such treatments it should be discontinued and another type of treatment instituted. While its greatest field lies in the treatment of acute abscess it is eminently worth while in the treatment of chronic abscess and a goodly number, even several months old, may clear completely following the establishment of adequate drainage by bronchoscopic methods. Good effects come, not from the passage of the bronchoscope itself, but from the establishment of adequate drainage from the abscess through a free bronchus by the dilatation of strictures so commonly present in lung abscess, by removal of obstructing granulation tissue, by removal of foreign bodies, and by the removal of dead tissue from the abscess cavity itself. The removal of tissue from the obstructing area for microscopic examination at the time of bronchoscopy cannot be too strongly stressed, as 10 per cent of chronic lung abscesses develop distal to a degenerating malignancy of the bronchus which might otherwise be missed. The valuable aid which the bronchoscopist may give in the localization of the abscess must not be overlooked.

Aspiration.—I mention external aspiration in speaking of treatment of pulmonary abscess merely to condemn a practice all too commonly used in the presence of this type of pulmonary suppuration. It seems to me that almost every abscess I have seen recently has either been needled or such a recommendation has been made before considering surgical drainage. Don't do it. The practice is dangerous and at the best cannot hope to cure the condition. In the first place these abscesses contain not only pus, but fiber masses, clots and dead tissue, which not only could not be aspirated through the ordinary needle even of veterinary proportions, but could not be pulled through the ordinary catheter, so the chances of accomplishing anything by such aspiration are nil. Secondly, there is danger of inducing hemorrhage, air embolism, or metastatic foci by such manipulation. Thirdly, and by far the most important: While the presenting point of the abscess towards the pleura may be surrounded by adhesions and therefore walled off from the free pleural cavity there are all too frequently extensive areas of free pleural space adjacent to this point so that the exploring needle may not only cause air leakage into the pleural cavity resulting in accidental pneumothorax but it may cause a rupture of the abscess into the free pleural space or contamination of the intact pleural cavity by the myriads of organisms present in the abscess and adjacent lung tissue as the needle is withdrawn across the obliterated space. One has only to be called upon to see, or smell or treat a putrid empyema resulting from such an attempt to forever be cured of such a practice. The aspirating needle should be inserted into the lung or abscess cavity only at the operating table with the pleura exposed as the abscess is about to be surgically drained.

Artificial Pneumothorax.—Again I mention a procedure which should not be advocated in the treatment of pulmonary abscess, for it, likewise, is dangerous. The chances of a successful result from its use are not particularly great. We should expect no results from its use unless the bronchus were patent and the abscess draining freely, and then it should not be necessary, for under such conditions the abscess will usually heal spontaneously. Pneumothorax can do nothing save squeeze down the lung in an attempt to approximate the walls of the abscess cavity. Unless there is adequate drainage for the necrotic material present in the abscess, the walls cannot be brought into apposition and the collapse of the surrounding tissue may well interfere with rather than favor drainage through the bronchus. Likewise, there are usually some local adhesions about the peripheral point of the abscess which will prevent complete collapse of the involved lobe, and pulling upon these adhesions by increasing intrapleural pressure may well tear through infected tissue, cause a perforation of the abscess into the free pleural cavity, or contamination of the pleura without rupture of the abscess directly. A violent, putrid empyema resulting from such contamination may be extremely serious if not fatal to the patient.

Localization of Abscess.—Accurate localization of the position of the pulmonary abscess is essential to both medical and surgical treatment of the condition. To the medical man it is important in the selection of a proper posture to facilitate drainage after the bronchus is open. To the surgeon, considering external drainage, it is of even more vital importance, for his approach should be made over the most superficial point of the abscess to avoid the necessity of traversing lung tissue to reach it. Localization of the abscess may be accomplished by several methods or a combination thereof. First, the occurrence of a local area of pleurisy may indicate the presenting point of the abscess cavity against the parietal pleura. Second, the finding of local point tenderness in the interspace may very sharply localize the position of the abscess, an indication of local pleurisy and hypersensitivity of the parietal pleura in this area. Physical examination by percussion may accurately localize the process or the stethoscopic findings of consolidation or cavitation may be of help. True cavity findings are encountered much less frequently than in tuberculous cavitation, probably because of the more frequent occurrence of bronchial narrowing in these suppurative conditions.

Bronchoscopic examination may be of great value in localization of an abscess by indicating from which bronchus or bronchial radical the pus from the abscess appears. A blocked, branch bronchus or area of granulation tissue may be the sentinel to indicate the position of the communicating bronchus. A word of caution might be inserted to avoid an occasional mistake which can easily be made if local conditions are not taken into account. An abscess which lies adjacent to an interlobar fissure may penetrate this fissure and drain through a branch bronchus of an adjacent lobe, thus pus may be seen coming from a small branch of an upper lobe bronchus whereas the main abscess originated within the lower lobe.

Roentgen examination, of course, offers a very accurate method for localization of the pulmonary pathology. Exposures taken in the posterior-anterior and lateral direction will usually give a better localization of the process than will stereoscopic plates. It is usually advisable to accurately localize the abscess at the earliest possible moment, as subsequent thickening of the pleura or the development of a pleural effusion may later render such localization by x-ray difficult or impossible. The recent developments in tomography or planography have proven of great value in this type of work, particularly in the presence of thickened pleura, pleural effusion and multilocular abscesses where a fluid level with an air pocket above are not present to give sufficient contrast to be easily seen, particularly on the lateral exposure.

Treatment.—(1) Diaphragmatic Paralysis: The use of phrenic nerve interruption to paralyze the diaphragm in the treatment of pulmonary abscess has been advocated from time to time but has never become particularly popular and probably should not be. If the abscess is adequately drained through a bronchus and some help is necessary to bring about approximation of the abscess cavity walls then perhaps phrenic interruption might be of use. However, caution should be used, and it must always be remembered that paralysis of the diaphragm may be followed by excessive elevation and subsequent kinking of the draining bronchus and interference with drainage of the cavity. It might, therefore, increase rather than alleviate the difficulty. It must never be used unless the bronchus is widely open and the abscess adequately drained.

(2) Thoracoplasty: For the same reasons mentioned above, the use of extrapleural thoracoplasty in the treatment of these conditions is not to be advocated unless the abscess is adequately drained and some additional help is needed in the closure of a rigid walled residual pocket. Under these conditions the use of extrapleural thoracoplasty to reduce chest volume and approximate cavity walls, or obliterate empyema cavity, might be advantageous. Here, as in phrenic nerve surgery, unless the abscess cavity is adequately drained, extrapleural thoracoplasty should not be used, as it may bring about kinking of the bronchus and interference with drainage.

Extrapleural Plombe or Packing.—The use of some form of extrapleural packing following the stripping of the parietal pleura from the inside of the chest wall surgically, either in the form of gauze or a paraffin mass, has been advocated and used in the treatment of pulmonary abscess. Theoretically, in the presence of a peripheral abscess, adequately drained through its bronchus, the application of external pressure in the region of the abscess wall should be of aid in obliterating the residual cavity. Some good results have been obtained by the use of this procedure in properly selected cases. It should not be used unless the abscess is draining adequately through the bronchus, and by the same token should not be used in the treatment of putrid abscess when the very nature of the discharge indicates that the cavity still contains a necrotic tissue which must be removed. In a modification of this procedure advocated by Dolley, packing material is placed outside the parietal pleura and periosteum following resection of the overlying ribs. It is well to remember here as in the corresponding treatment for peripheral tuberculous cavities that at times the peripheral shell of the lung overlying the cavity survives only through a blood supply acquired through the adhesions formed between visceral and parietal pleura, and that when the pleura is stripped from the chest wall for the insertion of the plombe, the blood supply is destroyed and necrosis of the cavity walls may occur from pressure or the rupture of the abscess into the pack bed. Extrapleural paraffin has likewise been used by Sauerbruch as the first stage in the drainage of pulmonary abscess, the irritation stirred up by its presence causing obliteration of the adjacent free pleural cavity. The pack is then removed and the abscess drained into the pack bed at subsequent operation.

Surgical Drainage.—The question as to which pulmonary abscesses should be drained and when they should be drained is one which cannot be settled arbitrarily, as individual conditions, location, experience and facilities available must be taken into account. Extensive figures have been compiled and published showing the comparative results and mortality of medical and surgical treatment of lung abscesses, both nonputrid and putrid, all of which are very confusing and after all may not mean much unless the extenuating circumstances in all cases are taken into consideration. First of all, pulmonary abscess and pulmonary gangrene are extremely serious conditions. The patients are desperately ill from a marked toxemia and a goodly number die before the process ever becomes localized. This is especially true in the putrid condition called pulmonary gangrene. Should the patient survive the acute process he is still desperately ill from an extremely serious condition. Supportive treatment with a minimum of external trauma should be the keynote at all times. When the process has become localized at the end of three weeks or thereabouts more active measures should be undertaken, using the simpler means first and the more radical only when they become indicated. If the process is clearing spontaneously and improvement is progressive, certainly no active interference should be undertaken. If it is not, bronchoscopic examination and treatment should be instituted in an attempt to obtain early adequate drainage of the abscess through the bronchus. If this can be accomplished the patient may be saved much more serious interference at a later date, and the duration of his illness may be vastly shortened. If this proves inadequate, either because entrance to the abscess cannot be obtained or because adequate drainage does not follow, the treatment should be discontinued, for it is folly to subject the patient to a whole series of procedures which are not producing the desired results. Needless to say, the manipulation should be gentle as possible and not performed by a beginner at this type of work.

If favorable response has not been obtained from the previous treatment, the question of surgical drainage of the abscess must be considered. The questions of when and how are often extremely important. There is firmly rooted in the medical mind the idea that no surgical attempt at drainage of pulmonary abscess should be undertaken within three months of the onset, and all too frequently this period is extended indefinitely in the hope that a miracle will occur and the abscess heal spontaneously. All of this was very well in its day, when thoracic surgery was in its infancy, but today the problem is much different. Manifestly, there is no excuse for surgical interference for a lung abscess which is healing spontaneously. Likewise, an abscess which is improving and receding under bronchoscopic aspiration should be allowed to continue to do so as long as the improvement is progressive and complete. Should this not result, surgical drainage should be considered. Pulmonary abscesses begin to heal when adequate drainage is instituted. They do not heal when there is inadequate drainage, when there is necrotic tissue present giving the putrid odor, when they are multilocular, which usually means inadequately drained, and when they have persisted for such a time that the wall becomes rigid and the lung fibrotic with secondary bronchiectatic changes in the adjoining tissue. If the pus and necrotic tissue cannot be removed through normal channels then drainage must be established by surgical means. Much of the high mortality attributed to surgical drainage of lung abscess may fairly be attributed to delay in submitting the patient for surgical drainage rather than to do the surgical manipulation itself.

Delay in establishing adequate drainage may permit the process to become multilocular, metastasis to occur, the pleural cavity to become infected or the patient to become so debilitated only a miracle could save him no matter what be done. It is true that there are certain definite dangers associated with operations for surgical drainage of the lung abscess, some of which can be minimized, some of which cannot. The dangers of shock and hemorrhage can be reduced by proper pre-operative and operative manipulations and the use of certain technical steps not pertinent to this paper. The danger of the development of an empyema can be greatly reduced by the use of a two-stage operation but cannot be totally eliminated. The danger of air embolism can be reduced but not completely prevented. The dangers of local spread of the disease can be lessened by avoiding heavy doses of sedatives which might hinder expectoration postoperatively. The danger of metastatic peripheral abscess which occurs spontaneously and which may be induced by local manipulation cannot be avoided.

The question as to whether to use a one-stage or two-stage drainage of a lung abscess can be settled rather simply. If the pleural cavity is completely obliterated in the exposed area, a single-stage drainage of the abscess may be undertaken, with approximately the same degree of safety as a two-stage operation, except for those abscesses which lie under the scapula and necessitate extensive discretion for proper exposure. In such a case it may be wiser to insert a pack to wall off the local area before grossly contaminating it with the myriads of organisms always present in these abscesses. If free pleural space is present, mere suturing of the lung to the chest wall may prove adequate to permit a one-stage drainage of an abscess but is quite likely not to do so, and secondary infection of the pleural cavity may result. Two-stage drainage of lung abscess is undoubtedly safer because it permits the walling off of the pleural cavity and the adjacent tissues before the inevitable contamination which must follow opening of the abscess into the local field. Even if the lung appears to be fused to the parietal pleura, it may be well to place an encircling suture in order to be sure that the manipulation of drainage of the abscess and subsequent packing does not tear down delicate adhesions and permit the adjacent pleural cavity to open.

With the field exposed, the local area is palpated to localize the abscess, an exploring needle is inserted and the abscess opened along the needle before it is withdrawn. While the making of a small opening for the insertion of a small tube may at times prove adequate it is not to be recommended. The opening should be made sufficiently large to permit exploration of the interior of the cavity, to permit the removal of devitalized tissue and a visual search for the openings of accessory pockets, particularly in those abscesses which have never shown a single fluid level on x-ray films. Following the removal of a necrotic tissue, which must be done gently to avoid producing hemorrhage, the cavity is packed with gauze to control any oozing. Stiff-walled tubes should not be inserted for fear that they may produce a slough of the lung tissue with subsequent hemorrhage. The external opening must be kept open until the abscess cavity has become obliterated by expansion of the surrounding lung or by granulation tissue if recurrence is to be avoided. It is to be expected that the process of healing will be slow, particularly in those abscesses which have existed for a long period of time prior to drainage. Secondary plastic closure by pedicle muscle flaps may subsequently become necessary but should not be done until all infection in the surrounding lung tissue has subsided. The recently published work of Neuhof, Mount Sinai Hospital, New York, on the early drainage of putrid lung abscess by surgical means is worthy of note, and may prove the answer to avoiding prolonged disability so frequently associated with this disease and its treatment.

Lobectomy.—This procedure has not been given particularly serious consideration in the treatment of lung abscess until the last few years because of the relatively high mortality associated with this operation in the earlier stages of its development. With the advances which have been made in thoracic surgery in the last few years and the lowered mortality which has come with greater experience in this field, it is now proper to at least consider the possibilities of lobectomy as a proper surgical treatment for certain lung abscesses of more chronic type. In this category might be included the chronic abscess from which the patient is having profuse or repeated pulmonary hemorrhage, the abscess with a more or less rigid wall which might be obliterated with difficulty after external drainage, and the chronic abscess associated with considerable bronchiectasis. The pleural cavity should not be too densely obliterated but a partial obliteration of the pleural cavity should render the procedure less hazardous. One of the cases presented in the lantern slide demonstration accompanying this paper illustrates this point. In this instance, the patient presented a more or less chronic right lower lobe abscess from which profuse pulmonary hemorrhage had occurred on several occasions. The pleural cavity was almost completely free of adhesions. A primary, one-stage, right lower lobectomy was performed in preference to a two-stage drainage of the abscess with a very favorable result. The question of the relative risk of the two procedures, of course, must always be borne in mind.

Bronchiectasis

Bronchiectasis is a condition and not a primary disease. It may develop on a congenital background but more commonly occurs secondary to a number of conditions such as pulmonary abscess, intra-bronchial foreign body or tumor, tuberculosis or a number of other conditions in which association of infection with bronchial stenosis or some other disturbance of bronchial drainage leads to weakening of the bronchial wall, dilatation and cavity formation, with the production and retention of various amounts of secretion in the involved area. This condition is essentially a chronic one whose early course is often mild and characterized by periods of complete or relative absence of symptoms. The early symptoms are those of a recurrent chronic bronchitis, while later there is more or less constant cough with expectoration of varying amounts of purulent sputum which may be foul or putrid if retention of secretion occurs. Intercurrent episodes of pneumonia or pneumonitis are relatively frequent. Pulmonary hemorrhage varying from slight streaks or pinkish sputum to repeated or profuse pulmonary hemorrhage occurs in at least one-half of the patients so afflicted, more frequently on a percentage basis than in patients suffering from pulmonary tuberculosis. Later in this disease, dyspnea, cyanosis of the lips, cheeks and digits occurs frequently and clubbing of the fingers and watch crystal nails are frequently seen. It may be compatible with life for long periods of time, although the recurrent attacks of pneumonitis are quite dangerous. In the earlier stages of the disease, the cough is more of a nuisance than a handicap, whereas in its later stages the frequent cough and profuse expectoration, particularly if associated with foul odor, is a serious handicap, interfering with work and more or less ostracizing the patient from his family and associates.

Diagnosis.—Before the advent of bronchoscopic examination and radiographic study following the injection of iodized oil into the bronchial tree, our knowledge of this condition was more or less confined to the advanced stages of the disease where the classical picture of the disease was all too evident. With the aid of these measures, it is not only possible to detect the condition in its earlier stages but to clearly outline the extent of involvement and the changes which may occur from time to time during the course of the process. Such information renders our attempts at treatment of the condition, particularly by surgical methods, more accurate and altogether more satisfactory. Before any intelligent attempt can be made at the treatment of this condition, it is absolutely essential that these studies be made and the exact extent and character of the local condition known.

Treatment.—Efficient treatment of this condition must, of course, vary with local conditions, the extent and duration of the process and the presence or absence of associated complications.

1. Constitutional Treatment: While these patients are frequently of fair nutrition, they are usually below par in more ways than one. Rather intensive hygienic treatment associated with an adequate amount of rest is usually indicated in order to improve the patient's general condition and his resistance against the infection which he is carrying. Special treatment may be required because of poor appetite, anemia, digestive disturbances, etc.

2. Respiratory Infection: As these patients are usually unduly susceptible to upper respiratory infections, they must be protected against these infections to the greatest possible degree by avoiding contact, avoiding exposure, the use of cold inoculations and other measures designed to avoid or minimize the effects of these infections upon the individual. Active treatment of even slight upper respiratory infections is to be advocated to minimize their severity or the possibility of their extension to the lung.

3. Sinus Disease: The majority of these patients are suffering from chronic upper respiratory disease with involvement of one or all of the sinuses, infected tonsils, etc., and special attention should be directed toward the treatment of these conditions, not in the hope that by relieving the patient of his upper respiratory trouble the damage already done to the lung will be corrected, but rather in an attempt to render the individual less susceptible to frequent infections, and to stop or at least slow up the progress of the condition in the lung.

4. Change of Climate: If the individual suffering from bronchiectasis lives in a climate in which respiratory infections are frequent and changes in weather are marked and severe it may be well to advise a change of climate to one more mild or less rigorous in the hope that a diminished number of upper respiratory infections may benefit the patient and his bronchiectasis. It is illogical to expect such a change in climate to cure the condition but such a change may be important in the alleviation of symptoms.

5. Drugs: The use of drugs of various types, cough mixtures, both sedative and expectorant, may be of some value in symptomatic control or in facilitating expectoration. They may be an aid in keeping the patient comfortable and rendering his expectoration less difficult or helping to relieve odor, but it is to be considered palliative and not curative. The use of arsenic and bismuth may in some instances help to reduce the foul or putrid odor of the sputum but in no way affects the original condition, merely inhibiting the growth of certain putrefactive secondary organisms.

6. Postural Drainage: Postural drainage is of definite value in the treatment of bronchiectasis. It is not curative in any sense of the word, but it may help the patient to raise his sputum with less effort or at stated times rather than continuously, and by facilitating drainage and eliminating stasis it may be a great factor in reducing the fetor of the sputum, thereby rendering the individual less obnoxious to his associates. The proper position to be used must be determined by experiment and utilized faithfully if the patient is to derive the greatest benefit from it.

7. Bronchoscopic Manipulation: Bronchoscopic examination and treatment may be of definite value in bronchiectasis by localizing the process, by detecting the presence or absence of stenosed bronchi, by permitting the discovery and removal of offending foreign bodies or obstructing tumor tissue, and by opening stenosed areas to promote more adequate drainage. The use of repeated bronchoscopic examination or lavage of the bronchial tree would seem to be of questionable value in treatment aside from the more adequate drainage effected by the manipulation and dilating of strictures.

8. Collapse Therapy:

(a) Artificial Pneumothorax: While occasionally, in early bronchiectasis, the use of artificial pneumothorax may seem to be followed by definite and rather lasting improvement from the symptomatic standpoint, it should be emphasized that collapse of the lung by artificial pneumothorax does not as a rule bring about a closure of the bronchiectatic dilatation because of the intrinsic rigidity of the bronchial walls. For the control of hemorrhage from the lung, the use of artificial pneumothorax in bronchiectasis may be equally as efficient as in pulmonary tuberculosis, where it is of proven value. The dangers of secondary infection of the pleural cavity from the infection within the lung cannot be overlooked and offers a very potent argument against the use of this treatment, particularly in the more advanced stages of the disease.

(b) Phrenic Nerve Surgery: Paralysis of the diaphragm on the affected side occasionally is followed by improvement in symptoms but is not to be recommended for frequent use, as the elevation of the diaphragm which occurs is quite likely to bring about change in position and angulation of certain of the bronchi of the lower lobe and frequently is followed by interference with drainage rather than improvement thereof.

(c) Extrapleural Thoracoplasty: The use of extrapleural thoracoplasty for the treatment of chronic bronchiectasis may be followed by some reduction in both cough and expectoration, but the results obtained thereby in no way compare with the favorable effect obtained by the use of the same method in the treatment of pulmonary tuberculosis. If one is to be satisfied with partial reduction in symptoms, then at times the procedure may be worth while; but in spite of the collapse obtained, the bronchiectatic dilatation remains, the rigidity of the abscess walls preventing collapse as the chest wall is compressed, and secretion is still produced and expectorated. It is possible here, as in the use of phrenic nerve surgery, that the change in position brought about by the collapse obtained may at times seriously interfere with the drainage from the involved area.

9. Cautery Lobectomy: The use of cautery lobectomy as advocated by Graham a number of years ago has never become particularly popular and is not utilized very widely in the treatment of chronic bronchiectasis. It should be used only where the pleural cavity is obliterated. The destruction of the peripheral portion of the lung produced by the cautery creates external drainage for the bronchiectatic areas by the creation of multiple bronchial fistulæ. Through these the secretion formed in the involved area drains to the outside rather than being coughed up, thereby reducing the amount of cough and expectoration and perhaps reducing the foul odor by avoiding stasis. Continuous and prolonged drainage is necessary if any benefit is to be derived from it. The dangers of hemorrhage and embolism must be understood and the necessity for daily dressings for a long period of time realized before the procedure is undertaken. The field of usefulness has been diminished greatly by the more modern advances in lobectomy and pneumonectomy.

10. Lobectomy: The surgical treatment of bronchiectasis carries with it an element of risk

which, while it has been greatly reduced in the past few years, is still sufficiently great to engender caution in the selection of patients to be subjected to this type of treatment. Under no circumstances should it be undertaken too lightly. The degree of bronchiectasis present and the symptoms produced by it must be sufficiently severe and disagreeable to the patient to warrant the risk involved in the surgical extirpation of the lesion. If the lesion is unilateral and confined to one lobe and is producing symptoms sufficient to justify the risk entailed, then surgical extirpation of the involved area offers a means of ridding the patient of the diseased tissue in its entirety and should be considered. While the details of this surgical procedure are not pertinent to this paper, they should be reviewed by anyone considering the recommendations of such a procedure, so that a balanced judgment of the procedure and its possibilities may be obtained. Lobectomy in one or two stages may be performed, depending upon the obliteration or freedom of the pleural cavity, with possibly slightly less risk present where the residual lobe is already adherent to the chest wall. Postoperative bronchial fistula and localized empyema are a frequent occurrence following this procedure and somewhat delay the complete recovery of the patient. They do, however, eventually heal. There is a small field for the use of bilateral lower lobe lobectomy but steps in this direction are to be undertaken rather cautiously because of the known tendency of the process to slowly progress and involve adjacent lobes at a later date. The patient's residual vital capacity and working capacity must be taken into consideration before deciding upon such a procedure. Lobectomy may be performed both in children and adults and will undoubtedly become a more common operation as a greater knowledge of its possibilities develops.

11. Pneumonectomy: Certain extensive cases of bronchiectasis, either congenital or acquired, can only be successfully treated by the removal of the whole of the involved lung. This constitutes a very drastic step in the treatment of such a condition, but, under the circumstances, it is at times the only thing which can be offered to the individual to relieve him of an extremely distressing condition. Removal of the whole lung for suppurative disease undoubtedly carries with it greater risk than total pneumonectomy for primary malignancy of the lung, because of the associated extensive infection and greater danger of contamination of the pleural cavity. It is, however, to be considered and has been carried out successfully in a number of instances in this country. The risk, of course, is materially greater than that of lobectomy but may be amply justified by the extremely extensive disease which necessitates such a radical intervention.

Secondary Bronchiectasis Developing During the Course of Pulmonary Tuberculosis

During the past few years, more intensive study of the tuberculous individual and the more frequent use of bronchoscopic examination and iodized oil instillation into the lung in the patient suffering from pulmonary tuberculosis has brought to our attention the relative frequency of bronchial stenosis and secondary atelectasis and bronchiectasis in the tuberculous lung. Since we know of the existence of such a condition, we look for it and find that it is not a rare condition but one which develops under our eyes fairly frequently during the course of this disease. Apparently ulceration of the bronchus is followed by the development of granulation tissue in the ulcer base and this in turn reduces the bronchial lumen, giving a partial or even complete obstruction. Obstructive emphysema or atelectasis develops, depending upon the degree of obstruction present, whether the stenosis has merely narrowed the lumen or produces a check valve or a stop-valve in the bronchus involved. Periodic retention of secretion with sepsis follows if secondary infection is present. If not, simple atelectasis may supervene with a permanent loss of function of the involved portion of the lung. Distal to the stenosed area, secondary bronchiectasis develops very frequently and may be either a non-productive or productive type. To this condition the term "tuberculous bronchiectasis" has at times been applied but it is apparently the same type of bronchiectasis which develops in a non-tuberculous lung under similar circumstances. It is bronchiectasis developing in a tuberculous lung, associated with tuberculosis but not a characteristic part of the tuberculous picture. Bronchiectasis without bronchial stenosis may also be seen in a tuberculous lung as a result of the extensive fibrosis and retraction which occurs in the healing of a tuberculous process.

Both of these types of bronchiectasis in the tuberculous lung may account for persistent cough and expectoration with negative sputum or amounts of sputum out of proportion to the amount of active tuberculous involvement. The use of collapse therapy has been held forth as the cause of the development of bronchiectasis in the tuberculous lung but I do not believe that its use *per se* is responsible for these difficulties. They occur in the tuberculous lung without collapse therapy just as well as during the procedure. Frequently, if a thorough investigation is made it will be found that symptoms suggestive of this type of involvement were present before the collapse therapy was undertaken but were overlooked at the time. Ulceration and stenosis of the above mentioned type may occur any place in the tracheal system. Cases of tracheal stenosis, stenosis of the primary bronchi and any of the secondary bronchi have been observed. Both upper and lower lobe involvement is seen. The process in our experience is far more frequent in females than in males. The use of collapse therapy in the presence of bronchial obstruction is less likely to be followed by complete clinical results than in the patient without this complication. Its use, however, is still justified, even in the presence of known partial obstruction with the knowledge and understanding, however, that complications may result and that subsequent secondary intervention may be necessary.

From the standpoint of treatment, this condition presents some points which are distinctly different from the treatment of bronchiectasis without associated tuberculosis. In the first place, bronchoscopic dilatation of stricture is less likely to succeed in these individuals than in non-tuberculous types. The traumatization of tuberculous granulation tissue is quite frequently followed by an increase in obstruction rather than a lessening of it. The surgical treatment of this problem must also be undertaken in a little different way. Pulmonary tuberculosis is a disease which is rather easily disseminated and contralateral spread of the disease or extension to an adjacent lobe is more likely to occur in tuberculosis than in non-tuberculous disease. The occurrence of tuberculosis in the wound is more likely to leave chronic discharging sinuses and persistent bronchial fistulæ than in the presence of non-tuberculous involvement. In spite of these points, we have been and will continue to be forced to attempt to do something for individuals with tuberculosis who present this distressing complication.

If the patient has obstruction which is nearly complete with retention of secretion and secondary sepsis and is desperately ill, some type of drainage operation may be more suitable than an attempt to excise the involved area. In this type of patient, either without or with thoracoplasty in the presence of obliterated pleural cavity, we have purposely chosen to use the Graham cautery type of external drainage and have had a few rather encouraging results therefrom. In spite of a number of disadvantages of this type of treatment, I believe that for individuals of this type it has advantages which outweigh the known disadvantages. For the patient who already has collapse therapy with obliteration of the pleural cavity and a lower lobe bronchiectasis without sepsis, primary lobectomy with excision of the involved lobe would be a nicer procedure. The dangers of over-expansion of an upper lobe diseased with tuberculosis in order to fill the whole pleural cavity with it to obliterate the space left by lobectomy cannot be disregarded, for the danger of re-activation of the tuberculosis present is certainly far from small. The danger of dissemination of tuberculosis to the contralateral lung, or generally, cannot be overlooked. The same points must be considered in total pneumonectomy for the complications of tuberculosis. A few such cases have been successfully treated by primary lobectomy or pneumonectomy, but fatal results have occurred in others and probably will continue to occur from time to time because of the very nature of the disease itself. However, in the tuberculous individual the complications produced by the late development of bronchial stenosis may be very distressing or disabling and may amply justify the risk entailed in attempting to relieve the patient of such a condition. The field is new and deserves much careful study and thought.

RECENT ADVANCES IN THE TREATMENT OF NEUROPSYCHIATRIC DISORDERS*

E. M. HAMMES, M.D.
Professor of Neurology and Psychiatry
Medical School, University of Minnesota
Saint Paul, Minnesota

DURING the past decade remarkable progress has been made in the various fields of neuropsychiatry. Recent studies in physiology, biochemistry, and electro-encephalography have enabled us to obtain a clearer understanding of the functions, the chemical structure, and the electric potentials of the central nervous system. The autonomic nervous system has finally been investigated to the extent that its importance to the vascular, glandular, and other systems is fully appreciated. However, further investigations are needed in this most interesting field.

The diagnoses of the various neuropsychiatric disorders have been placed on a higher and more scientific plane than ever before, primarily due to a more universal application of spinal fluid studies, due to a better understanding of the various neuropsychiatric syndromes associated with endocrine dysfunction, and especially due to a more thorough training in every field of medicine.

Neuropsychiatric therapy is keeping abreast with this diagnostic progress. Formerly our therapeutic armamentarium consisted almost solely in the use of sedatives, arsenic, electricity, and the more obvious surgical procedures. So many remarkable and almost specific therapeutic measures have been developed during the past decade that it is impossible to detail them in this brief summary. For that reason, only a few that are of general interest will be discussed.

The advances made in the field of neurosurgery, in intracranial and spinal neoplasms, in operations on the sympathetic nervous system, and in the treatment of cerebral injuries must be mentioned in passing. The progress in the past decade in this particular specialty, as to scientific ingenuity and as to therapeutic results surpasses every other surgical field.

Treatment of Deficiency Diseases.—The importance of certain vitamin deficiencies as etiologic factors in the development of various nervous diseases has been emphasized in the past few years and experimental studies have conclusively proven this relationship. Wortis has called attention to the importance of the enzymes and vitamins in brain tissue and believes that all central nervous and mental manifestations must ultimately depend upon biochemical reactions underlying brain metabolic functioning.

The principal vitamins which play a rôle in nervous diseases are: (1) the lipid-soluble vitamin A, (2) the water-soluble vitamins B (B1 and B2); (3) the water-soluble vitamin C; (4) the lipid-soluble vitamin D; and (5) the lipid-soluble vitamin E.

Absence or deficiency of vitamin A leads to xerophthalmia, deficiency of lacrymal and salivary secretion and at times to partial night blindness. Hughes, Lienhardt and Aubel fed pigs and chickens on a vitamin A deficiency diet. These animals developed impaired vision, muscular spasms and incoördination of movements. Degenerative changes in the long fibres of the spinal cord, in the optic, sciatic and femoral nerves could be demonstrated.

Deficiency in vitamin B1 produces polyneuritis and that due to vitamin B2 produces pellagra not infrequently associated with a psychosis. Prichart has further demonstrated degenerative lesions in the central nervous system caused by vitamin B1 deficiency.

Alcoholic polyneuritis is evidently due to a B1 avitaminosis and not produced by the toxic effect of the alcohol. The alcoholic has usually impaired appetite and digestion resulting in a reduced vitamin B intake. Jolliffe and his coworkers made a survey of the diet of twenty-six alcoholics with neuritis and sixteen alcoholics without neuritis. In every instance of the twenty-six alcoholics with neuritis they found an inadequate vitamin B intake. The sixteen alcoholics without neuritis had an adequate consumption of the vitamin based on Cogswell's formula.

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Other studies by Wortis indicate that chronic alcoholics with polyneuritis or the various forms of alcoholic psychosis tend to have a subnormal vitamin C content of the blood and spinal fluid. This again emphasizes the nutritional factor in the production of nervous and mental changes in chronic alcoholics. Unfortunately the alcoholic psychoses do not respond as favorably to vitamin B therapy as polyneuritis does.

Zimmerman and his co-workers studied twenty-seven dogs who were fed on a normal diet except that it was entirely lacking in vitamin B2. The dogs developed a slowly progressive muscular weakness with incoördination, decrease of the deep reflexes, vomiting and bloody diarrhea, with death after three and a half to twenty months. The lesions consisted of marked demyelinization of the peripheral nerves and degeneration of the medullary sheaths and axis cylinders of the posterior columns. These pathologic changes were similar to those observed in cases of human pellagra.

Deficiency of vitamin C leads to scurvy and in advanced cases may cause headache, convulsions and delirium. These latter symptoms may be due to cellular anoxemic defects.

Vitamin D deficiency produces rickets. In some of these children the blood shows a low plasma calcium with normal inorganic phosphates, with a tendency to develop tetany.

Although vitamin E deficiency primarily produces sterility in both males and females, Evans and Burr have shown that a large percentage of the suckling young born from mothers deprived of vitamin E will develop a peculiar paralysis.

This brief summary emphasizes the important rôle of avitaminosis to neurological diseases.

The treatment of these disorders depends primarily in supplying the deficient vitamins either by a diet rich in these vitamins or in concentrated form in the various pharmaceutical preparations. Reference should also be made to the excellent results obtained with nicotinic acid in addition to a rich vitamin diet in the treatment of pellagra with prompt relief of the cutaneous lesions and also of the psychotic manifestations. Spies and his co-workers have recently reported a very interesting study of seventy-three cases with this disease treated with nicotinic acid.

Pfaffenberg and Mielke have also reported some favorable results in the treatment of early cases of funicular spinal diseases with vitamin B1.

Hirata and Suzuki treated 10 patients with progressive muscular dystrophy with large doses of vitamin C. They believe that vitamin C reestablishes the dynamic activity of the muscles and has a favorable influence on muscle metabolism. Their results are somewhat encouraging in the early cases.

Treatment of Infections.—Although intensive studies of the virus infections of the central nervous system have been conducted, no definite results have been obtained in many infections either from the etiologic or therapeutic standpoint. The organisms for poliomyelitis, encephalitis or herpes are still undetermined. Prophylactic and immunizing measures such as the nasal application of chemical compounds or the convalescent serum against poliomyelitis have not proven as successful as anticipated. Pette and Hampel have shown that the intramuscular injection of convalescent polio serum did not protect or alter the course of the disease in monkeys against polio virus inoculated intracerebrally. With intraneural inoculations (sciatic nerve) the immunizing results were more successful in some instances. Jungeblut believes that vitamin C may play a neutralizing rôle in preventing infections of the central nervous system. Paralytic doses of poliomyelitis virus when mixed with small amounts of crystalline vitamin C were rendered non-infective when injected into monkeys intracerebrally.

Measures against epidemic encephalitis, the scourge of our present generation, have been just as discouraging. When we consider the thousands of cases that have occurred in Minnesota alone, we can appreciate its ravages throughout the civilized world. Salicylates or acroflavine intravenously with spinal drainage have given results in some of the acute cases. Benzedrine sulfate, stramonium and belladonna may relieve some of the distressing sequelæ. The Pasteur prophylaxis against rabies and the antitoxin against tetanus with their remarkable results offer some hope that scientists in the near future may develop similar measures against poliomyelitis and epidemic encephalitis. Definite progress has been made in the treatment of the various forms of meningitis. The introduction by Jochman in 1906 of a specific antiserum against meningococcus infection followed soon after by spinal drainage materially lessened the mortality rate. Meningococcus antitoxin was developed by Ferry in 1932. Hoyne reported a mortality rate of 23.5 per cent in eighty-five cases with antitoxin as compared with 45.9 per cent in 211 cases with the standard serum. Other workers have reported similar results. With the introduction of sulfanilamide in 1935 and with this additional therapeutic measure the mortality rate has been further reduced, according to some writers as low as 9 per cent. Antimeningoccic serum or antitoxin intravenously with prontosil intramuscularly or sulfanilamide orally offers the best therapeutic results. Although the administration of this serum or antitoxin by the intraspinous route is being gradually abandoned because of the irritative effect on the inflamed meninges, repeated spinal drainage will favorably influence the course of the disease.

Other pyogenic infections such as streptococcus and pneumococcus meningitis respond satisfactorily in many cases to sulfanilamide. The virus infections, however, are resistant to this treatment.

Hemophilus influenzal meningitis (Pfeiffer's bacillus) occurs usually in children between the ages of two months and three years, with a mortality rate of 98 per cent. Fothergill has found this type nearly twice as frequent as the meningococcic type. A specific antiserum has been produced by the Massachusetts Department of Public Health. With this antiserum given intravenously and intraspinally the mortality rate has been lowered to 84.6 per cent.

The treatment of syphilis and of its involvement of the central nervous system is familiar to all. With the introduction of salvarsan by Ehrlich in 1910, the therapy of syphilis was placed on a rational basis and the tendency for involvement of the nervous system greatly lessened. In the treatment of parenchymatous syphilis, the various forms of salvarsan were largely replaced by tryparsamide prepared by Jacobs and Heidelberger in 1917. The Swift-Ellis and other forms of intraspinal salvarsan therapy are still utilized but their application is limited. The various forms of fever therapy, particularly the inoculation with malaria in general paresis, have materially increased our therapeutic results. Epstein observed that the percentage and duration of the remissions in general paresis are greater both clinically and serologically with malaria than with fever produced by diathermy and related mechanical modes of hyperpyrexia.

Within recent years, bismuth has gradually replaced the other heavy metals such as mercury. A very encouraging report has recently been published by Moore on the results of the treatment of syphilitic primary optic atrophy with malaria and the Swift-Ellis technic.

Marked progress indeed has been made in the prevention, in the treatment, and even in the cure of this disabling infection of the central nervous system.

Treatment of Convulsions.—The pioneer work of Berger in developing the electro-encephalograph and the resultant studies in normal and abnormal electric activities of the cerebral cortex have completely altered our viewpoint in relation to epilepsy. We now know that epilepsy is due to the development of abnormal rhythms in the cerebral cortex. Gibbs and Lennox classify epilepsy as a paroxysmal dysrhythmia. This abnormal rhythm obtained during seizures is distinctive for the three main types of epilepsy. The grand mal type has a fast, the psychomotor equivalent a slow, and the petit mal type an alternating fast and slow rythm. Because anticonvulsant drugs slow cortical rhythms, they are more effective in the grand mal than in other types of seizures. Clinical results have amply verified this effect on the grand mal type without any previous logical explanation.

Bromides have been used in the treatment of epilepsy for almost a century and are still recognized as a moderately successful anticonvulsant. This treatment has been gradually replaced by phenobarbital, first recommended by Hauptman. Phenobarbital is more effective, its prolonged use even in fairly large doses is not accompanied by mental sluggishness, acne or any of the other complications which may develop with continued bromide medication. The addition of the ketogenic diet suggested by Wilder in 1921 has been found quite valuable, particularly in petit mal in children.

Merritt and Putnam have been experimenting on cats with a new series of anticonvulsant drugs. Interrupted electric currents were passed through the animal's head and the effect of the drugs was determined by measuring the convulsive threshold.

Five drugs not previously used as anticonvulsants (diphenylhydantoin, acetophenone, acetophenone-oxine, benzophenone and propriophenone) were found to have a greater anticonvulsant effect than phenobarbital or bromides. These new preparations are being used clinically but no published results are available at present.

Although cerebral surgery has not been very successful in epilepsy, the excellent results obtained by Penfield in some of his carefully selected cases offer a more optimistic outlook.

Hyperpyrexia or Fever Therapy.—For many years clinicians have observed the favorable effect on chronic nervous and mental disorders when complicated by an acute infection associated with high temperatures and leukocytosis. The malarial treatment of paresis instituted by Wagner von Jauregg in 1918, however, was the first outstanding example of the clinical utilization of fever. Since then many methods have been employed. The intravenous injection of triple typhoid vaccine, diathermy, and other mechanical devices are the most frequently used.

The physiological phenomena observed in fever and their therapeutic role are as yet little understood. Studies suggest that fever inhibits the development and growth of invading organisms, that it has a stimulating effect on the functions of the hematopoietic tissues and a mobilization of reserve leukocytes, and that it produces significant changes in the functioning of the autonomic nervous system.

Among the neurological disorders, acute chorea has responded most favorably to hyperpyrexia. With intravenous injections of triple typhoid vaccines, the duration of the disease has been greatly shortened and the usual complications lessened in many instances. Electrically induced temperatures produce similarly favorable results. This therapeutic measure has also been found beneficial in multiple sclerosis by producing more frequent and more prolonged remissions. Since multiple sclerosis consistently tends to have spontaneous remissions, any form of therapy must be carefully evaluated. Everyone is familiar with the excellent results obtained with malaria in paresis. However, other psychoses, particularly the resistant melancholias, respond favorably to induced hyperpyrexia. Frequently one observes a decrease in the depression and a better insight on the day following a satisfactory temperature reaction.

Other Neurological Disorders.—In 1934 a committee was appointed by the American Neurological Association to study the problem of therapy in *multiple sclerosis* for a period of five years. Various types of treatment were suggested and are being carried out. Among these are the use of quinine hydrochloride, typhoid vaccine, malaria, silver salvarsan, intraspinal lecithin, high vitamin diet, viosterol, and liver. In our personal experience quinine hydrochloride orally with typhoid vaccine intravenously has been fairly successful.

The use of ergotamine tartrate for the relief of individual attacks of *migraine* has produced surprising results. Ergonovine, a similar drug, although not quite as active, has certain advantages. It is more readily absorbed by the gastrointestinal tract and for that reason more effective when administered orally. Nausea, evidences of uterine cramps and muscle soreness are less pronounced. In a series of 140 cases Lennox obtained complete relief from the attacks of migraine headache in 89 per cent with the injection of ergotamine tartrate. In seventy-eight patients, thirty-seven per cent obtained relief with ergonovine hypodermically. In cases where the headache is persistent, an additional intravenous injection of 2 c.c. of the amidopyrine compound, cibalgine, may terminate the attack. In all probability these favorable results from the ergot extracts are due to the contraction of the intracranial arteries and the depression of the heart rate. In cases resistant to this treatment, surgical procedures have been employed. Cervical sympathectomy, alcohol injection of the gasserion ganglion, section of the temporal artery or section of the meningeal artery have been followed by permanent relief in some instances.

Treatment of Meniere's Syndrome.—Although Meniere's disease is not fatal, the recurrent attacks of profound vertigo and falling may eventually lead to chronic invalidism, because of the tendency to recur. The medical treatment by Fürstenberg has given complete relief in many cases if carried out conscientiously and over a prolonged period. It consists mainly in an absolute sodium-chloride-free selected diet with large doses of ammonium chloride in capsules and some mild sedative. The surgical section of the auditory nerve has also proven successful in many stubborn cases.

Myotonia congenita with its inability to contract and relax voluntarily musculature has been greatly benefited by the use of quinine hydrochloride as suggested by Kennedy and Wolf.

The marked muscle fatigability due to *myasthenia gravis* has been relieved and the tendency to remissions increased by the administration of prostigmine and glycin.

The treatment of *narcolepsy* with benzedrine sulfate has given satisfactory results in relieving the attacks of uncontrollable sleep, if given in sufficiently large doses. This drug has also been recommended in the treatment of chronic encephalitis, asthenia, mild melancholia, and other forms of mental depression. However, its indiscriminate use should be discouraged.

Surgical measures have finally been devised for the relief of pain in many of the chronic neurological disorders. Morphine and its allied drugs, pantopon and dilaudid, are still our most powerful agents. However, the danger of drug addiction from pantopon and dilaudid, as well as morphine, limits their application in these prolonged or recurrent diseases associated with pain. The local alcohol injection or the radical cure by sensory root resection in trifacial neuralgia has given relief to many intense sufferers. Similar results have been obtained in other prolonged neuralgias by the intraspinal section of the posterior roots. The surgical removal of a protruded intravertebral disc has alleviated many cases of sciatica and its allied symptoms.

The epidural or subarachnoid injection of absolute alcohol for the relief of pain in metastatic involvement of the nerve plexuses or the spinal cord is a simple and quite effective procedure. In some cases, however, section of the pathways for pain in the spinal cord as suggested by Spiller must be resorted to.

The Treatment of Schizophrenia.—The medical literature as well as the lay magazines have been teeming with articles on Sakel's insulin hypoglycemic treatment and also on Meduna's metrazol convulsive treatment for schizophrenia. For that reason only a brief résumé of these two interesting therapeutic procedures will be detailed. Sakel's first publication appeared in November, 1934. The treatment consists in daily increasing doses of insulin, until the so-called shock dose is reached. In our personal experience this shock dose varied from 50 to 220 units. The insulin injection is always given fasting, the shock or unconscious period maintained for from one to two hours followed by a feeding of sufficient amount of carbohydrates, preferably about 200 grams of glucose by nasal tube. Usually six shocks are given each week with one day rest period. These shocks are repeated until the desired result is obtained. If no favorable results are obtained with forty to fifty shocks, the treatment should be discontinued. According to Potzl and Forstig, the symptoms of insulin shock may be divided into four groups:

1. The first group includes symptoms arising from the autonomic system—variation of pulse rate and blood pressure, drop in temperature, perspiration and salivation, pallor and flushing. Of these, the drop in temperature and the perspiration are the most constant and therefore the best indication of shock.
2. The motor symptoms start with restlessness and tremor, passing through various stages of twitching until pathologic reflexes appear. At the end there may be convulsions ending in muscular flaccidity and coma with areflexia.
3. The disturbances of consciousness start with sleepiness; then comes sleep from which the patient can be aroused; later he cannot be aroused and is in coma.
4. The mental syndrome is variable—the excited patient may become composed, or the stuporous patient may go into a state of extreme excitement.

The indications for terminating the treatment are deep coma with flaccidity, laryngospasm, generalized extensor rigidity of the muscles or severe convulsions, tachycardia, Cheyne-Stokes respiration or a sudden fall in blood pressure late in coma. In about 7 per cent of the cases of shock, early termination is necessary for one of these reasons.

Judging from the literature, approximately 50 per cent obtain a satisfactory remission. Death occurs in from 1 to 2 per cent during the hypoglycemic treatment. Intracerebral hemorrhage and widespread degeneration of the nerve cells in the cerebral cortex have been found at post-mortem.

Meduna's first publication on the convulsion therapy with metrazol for schizophrenia appeared in 1935. His method consists in administering intravenously a solution of 10 per cent metrazol daily in increasing doses until the convulsive dose is obtained. This usually averages between 7 and 10 c.c. The required dose to produce a convulsion is given from two to three times a week. The results obtained from this treatment compare favorably with those from insulin shocks. Although the mortality rate is materially less, accidents have occurred, the most frequent being a dislocation of the jaw or a fracture of the humerus or femur during the severe convulsive seizure.

Prolonged observation and future studies will determine whether these remissions will result in permanent cures.

In this brief review, many other recent and valuable therapeutic measures have not been referred to. When the etiologic factors in some of our chronic neurological diseases will finally be determined, we will probably be able to check the degenerative processes early in many of these cases and prevent a life of invalidism.

The results with insulin and metrazol in schizophrenia suggesting some biochemical reaction in the central nervous system, are stimulating renewed interest in research in the so-called somatic psychoses. Thus we may ultimately be able to determine some organic bases for these so-called functional psychoses and arrive at a better and more scientific therapeutic approach.

1125 Lowry Medical Arts Bldg.

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THE NERVOUS PATIENT*

A. E. MEINERT, M.D.
Winona, Minnesota

THIS evening I wish to say a few words about the nervous patient—the neurotic, if you care to call him that. In my experience, I should say the average practitioner gives too little attention to this patient, even though a fair percentage of his clientele consists of such people. As nervous patients, I wish to discuss not only the outright neurotic, such as the hysterical and the neurasthenic type, but also those who are nervously exhausted; patients who are too introspective, those with organic trouble who have a tendency to be neurotic and the individuals with vague complaints who fit into no clinical picture.

The more efficiently we treat this group, the better for the patients and the better for the profession. Many of the people who find fault with medicine come from this nervous group. Every physician gains a great satisfaction when he brings one of these patients back to normal health. Looking at the problem in this light makes it worth while for one to take greater care with each one. There is no question that the irregular healers derive a good share of their business from this large nervous group; and that gives us another reason why we should be more efficient in handling these patients. It gives us another means of decreasing the influence of the quacks.

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Even though one does not particularly like this class of patients, one is bound to have considerable dealing with them. Through an understanding of the problem one will be aided in handling his organic cases as well. It is largely a problem of understanding human nature—and as physicians that should be one of our chief qualifications.

If you do not care to handle the outright neurotic patient, or if he gets on your nerves, you should refer him to one of your fellow practitioners. This will be better for the patient as well as for you. The so-called fixed neurotic should be referred to a psychiatrist who is better qualified than any of us to solve the problems which are in the background. However, the majority of nervous patients can be handled properly through the office or home by everyone of us.

I believe that we can all handle these cases better than we do, if we have the proper attitude—if we are sympathetic and try to understand the situation that they are in. We must first and above all gain their confidences. The fact that they come to us means that they have some faith in us or that they are going to give us a trial, at least. We will gain the patient's confidence by giving him sufficient time to tell his story—we should not rush him. By being interested, tactful, sympathetic and kind, we strengthen that confidence. We must realize that his symptoms are real, and that he is suffering, and is not coming to our office just to throw his money away, or to have a look at us. Each and everyone of us could develop a nervous breakdown, if the proper circumstances were put into our path. So let us be sympathetic with these people—they are not malingers.

Of course, in addition to personal experiences, heredity and environment are in the background in the more marked cases. Fear, worry, maladjustment, fatigue, and insomnia are some of the chief difficulties you must aid the neurotic to overcome. Their fears may be in regard to their health—they fear cancer, syphilis, heart trouble, or one of a thousand things. And, of course, there is always the fear of financial trouble or the daily problems of life to be considered. They will not always tell you that they are afraid of this or that, but you can learn to read their minds, or interpret this from the story they tell you. Fatigability, that is, always being too tired, is a most common complaint. Many of these individuals take on more activity than they can handle; and they must be educated to know their limitations and to stay within their nervous reserve. The systems to which most of their complaints are referred are the heart, the digestive system and the head. However, they are apt to have symptoms referred to various parts of the body at different times. In one consultation you may clear up their symptoms in one system, and the next time they may be back with a new set of symptoms involving some other part of the body.

As history taking is very important in all medicine, so is it especially important with neurotics. One can frequently suspect that a patient is neurotic from the way he enters the office. In others, the pad of paper with a list of complaints is suggestive. As I previously have stated, these patients should be allowed to tell their story, because you antagonize them if you rush them. By listening carefully, you will know what to rule out in the examination and also get an insight into their fears. If you let them talk long enough, they will drop hints in this regard. You will do a certain amount of questioning before you start your examination, just as you do with other patients. By the time you are ready for the physical examination, you have, in many cases, made the diagnosis of a neurosis. However, one must not be too cocksure and forget the examination. The writing of a prescription and dismissing of a patient at this time is what sends so many of them to quacks. It is most important that you give the patient no idea of your diagnosis by word or by action, or attitude at this time.

After being a good listener and showing the patient that you are interested in his problems, you will give him a thorough check-over. Many cases of incipient tuberculosis, syphilis, hypo- and hyper-thyroidism, focal infections, deficiency diseases and others are frequently difficult to distinguish from functional disturbances, if not thoroughly studied and thought out. So the first thing a physical examination will do for you is to aid you in making a correct diagnosis. The physical examination and history will suggest certain laboratory aids and these should not be neglected. Every patient should have a complete urinalysis, a complete blood examination including a differential count and smear study and a blood Wassermann test. Some patients will need a basal metabolic rate determination; some a chest ray; others complete gastro-intestinal studies such as gastric analysis, stool and proctoscopic examinations, and x-rays of the colon, stomach and gallbladder.

The second thing the thorough physical examination will do for you is this—it will give you the information that will allow you to be positive. When you tell your patient there is no organic trouble, you will be able to tell him this with conviction; and the patient will sense this. The reason the quack has a good hold on his patients is because he is positive of what is wrong with them and he guarantees a cure. We can be positive on a sound foundation and must learn to be convincing, and, through our attitude and assurance, we can get the same effect the quack gets through his guarantee.

The third thing that the complete examination does for us is this—it saves us time in the end. These patients are apt to return frequently, each time with a new set of symptoms. You can again listen carefully and then check him quickly. If no organic trouble is found you will explain simply what has brought about these symptoms and then give him plenty of reassurance. In the large majority of cases, this is what he wants to hear. He wants to be assured that nothing new has developed. This consultation will not be so time-consuming as the first one was. If, on the other hand, you haven't been thorough in your first examination, these patients may soon make you doubt your diagnosis in their frequent sojourns to your office. Your doubts will be read by the patient, and they will soon be going to another physician.

Of course, we must keep in mind that even a neurotic may in time develop a cancer, a stomach ulcer, or any other serious sickness; and so we must be constantly on guard with these patients in order that we do not slip up on our diagnosis.

In the treatment, may I repeat, the greatest good is accomplished through a careful history and a thorough examination. One is certain to have the patient's confidence when this is done, and when one has that, 75 per cent of the battle is won. However, in addition to being thorough and interested in the patient's problems, one should strive to develop a likeable personality. A smile, a word of cheer, optimism and kindness should be a part of every physician's armamentarium. These little things frequently help the sick much more than medicine. Why does anyone ever neglect them? Patients do not like the sober-faced physician, even though he is capable. One must also remember that no patient likes the rough physician whether that roughness be physical or mental. Sarcasm has no place in the practice of medicine, and I know of no quicker way to lose a patient than through this means. Many of our nervous patients leave the office cured after we tell them they have no organic disease, or if we specify that they have a normal heart or that there is no evidence of cancer or that no operation is necessary. With some, you will explain in simple terms how their symptoms are brought about. In many of these patients, the nervous reserve is low, and you need to explain that they must avoid taking on too many responsibilities and too many outside activities. You can explain how nerve cells in various parts of the body may fatigue and cry out for rest through the symptoms the patient has. Explain to them how rest, relaxation, and good nourishing food will restore vitality to these run-down cells so that their tiredness, their tight feelings and other symptoms will gradually disappear. Each case is an individual problem; but most patients will be able to grasp simple explanations if they are given them, and their recovery will be all the speedier.

Insomnia must be combated in some of these patients. Giving mild sedatives for several nights will break the habit with some. Others may be benefited by warm baths; and still others by being convinced that sleep is not essential in their particular case. If they can learn to relax and not fret or worry about their inability to sleep, many of them will fall asleep without outside aid.

Some nervous patients are benefited by a course of massage, or ultra violet ray treatment. Some of this therapy may be psychic, but it brings the patient back to your office frequently; and you have a chance to chat with him and bolster his spirits. Some people have a natural leaning toward chiropractors or osteopaths; and a course of physical therapy plus explanations of how their symptoms are brought about will assist them back to health.

One may need to resort to some symptomatic medication, but this therapy should be minimized and discontinued as soon as possible. Greater good is accomplished by putting emphasis on simple explanations and through assurances.

The diet may need to be regulated at first—using small meals five to six times daily. The diet should be of the smooth high caloric type at first and gradually the rougher foods can be added.

In our diagnosis we must not label these people neurotics. Instead, we should call their ailment nervous exhaustion, or a *touch* of a nervous breakdown, or a functional disorder. We should get the thought across to them that we realize that their symptoms are real and not imaginary. We should not tell a person "There is nothing wrong with you, it is all in your head." Such a statement is very tactless; it does no good and antagonizes the patient.

Each one of us has his own way of handling these cases. Your method is best for you, yet, I hope that some of the points I have tried to bring out will be of benefit to you. My plea is that we all take a greater interest in these unfortunates.

SOME POINTS ON CROSS-EYES*

JOSEPH B. GAIDA, M.D.

St. Cloud, Minnesota

WHEN the retinal image of an object is focused exactly on the fovea, the eye is said to "fix" the object. Normally, when both eyes "fix" the object, each eye has an image of the object on its fovea, and these foveal impressions are transmitted to the brain and fused as one image in the visual centers. This condition is spoken of as equipoise, or orthophoria, and the eyes are said to be in equilibrium or to balance. This is the normal eye. In heterophoria whenever one eye alone fixes an object, and the fellow eye receives the image of the same object on a part of its retina distant from the fovea, then the brain takes note of two separate impressions. This results in double vision or diplopia and the eyes are crossed, but can be put in balance by muscular effort.

Strabismus, also called heterotropia, "cross-eye," "squint" or manifest squint, is a condition of the eyes in which the amount of squint is so great that it cannot be overcome by muscular effort. It is a condition in which the visual axis of one eye is deviated from the point of fixation. The eye which has the image of the object on its fovea is termed the fixing eye, while the other eye is termed the squinting or deviating eye.

Except in paralytic strabismus, or heterophoria and heterotropia due to accidental injuries, one does not find diplopia in cross-eyed cases, because the patient from infancy automatically suppresses this duplicate perception. This is why, when one examines a cross-eyed patient, one finds, in nearly all divergent and convergent squints, a fairly good vision in the one eye and an amblyopia exanopsia (loss of vision due to disuse) in the other. Some ophthalmologists, however, claim that the amblyopia is a congenital defect which precedes and causes the squint. Ophthalmoscopically, these amblyopic or so-called "neglected" eyes may be entirely normal.

There are several varieties of strabismus. Esotropia or convergent squint, also called internal squint, is the condition in which the visual axis of one eye is deviated inward, the other fixing the object. This is the most common form of squint. Generally, both eyes have some form of hyperopia or farsightedness, usually a high amount, and as a rule the squinting eye is the more ametropic. A concomitant squint is characterized by the power of the squinting eye to follow the movements of the other eye in all directions, the angle of squint always maintaining the same size or degree.

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The angle of squint can be measured accurately by several special methods. A rough estimate of the number of degrees of strabismus can be obtained by watching the light reflex on the cornea of the two eyes, and measuring with a millimeter rule the amount of turning in or turning out of the eyes. For instance, if one finds that the left eye is turned in three millimeters, then one has approximately 15 degrees of left internal squint, as one millimeter of deviation represents five degrees of squint.

It is important to notice which eye fixes in squint cases. If, under ordinary circumstances, the same eye always deviates when the other fixes, we have a monocular squint. If, however, either eye fixes readily, we have an alternating squint.

Squint can be periodic, namely the mother notices the squint only when the child is tired in the evening, or during an illneses. It may be constant. It is probable that originally the crossing is only periodic, but by daily constant usage of the eyes at close range with a great amount of farsightedness, which must be overcome by the child as he converges his eyes on the near objects, the suppression of the deviating image becomes confirmed, and the squint becomes continuous or constant.

Squint is often noticed in children in the first year of life. The average age, however, is three years. Squints occurring after five years are apt to be alternating, in which case excellent vision usually exists in each eye.

The following causes of strabismus are to be noted: (1) the disturbance of the relation between accommodation and convergence by errors of refraction; (2) the inequality in the vision of the two eyes, or amblyopia of one eye, which removes the natural stimulus of diplopia to exact convergence; and finally (3) disturbances of innervation and defective development of the fusion faculty. Defective innervation may affect the muscles and cause a shortening of the internal recti muscles, causing convergent squint, or relaxation of these same muscles may occur, which would cause divergence. The fusion center is in the cuneus, in the occipital lobe, and may suffer birth trauma. Sometimes, because of a congenital defect, the fusion faculty develops later than it should, or imperfectly, or not at all, in which case there is nothing to stimulate a coordination of the eyes, and, consequently, a permanent squint results. The fusion center is not fully developed until about the seventh year.

It is in these cases with poor fusion that one finds, besides the usual moderately high amount of ametropia, that certain eruptive fevers and infections, especially whooping cough, seem to bring on the squint. The severe illness or shock acts as a provocative agent in the presence of this fundamental cause of squint.

The influence of heredity is important. There is nearly always either a history of squint, left-handedness or stuttering, or all, in either the parents, parents' brothers and sisters, or paternal or maternal grand- or great-grandparents. Dr. Wenner and I have recently seen two families in which both of the parents were cross-eyed, one with seven children, the other with five, all of them cross-eyed.

Treatment of Convergent Strabismus

At the outset, it should be stated that no one, especially no doctor, is justified in advising a questioning mother or father to leave the squint alone, or, as it used to be said, "He'll outgrow it." Probably the eyes will become straight, a small percentage do, but blindness of the crossing eye is the price the patient has to pay. What if this person meets with an accident and loses his good eye? He then has only a blind or nearly blind eye, normal to all appearances but unable to perform its function.

In treating cross-eyes one must strive not only to correct the squint cosmetically, but also to improve or retain present vision. This can best be accomplished in children before the fifth year, and frequently up to the seventh, but only occasionally after that, because the fusion power is fully developed about the sixth or seventh year.

Treatment of strabismus will be discussed under three separate headings.

Refractive Treatment

Glasses which neutralize the refractive error should be ordered for every case of convergent strabismus. The refractive error must be accurately determined by retinoscopy after the use of atropine has thoroughly paralyzed the functions of the ciliary muscle. Atropine must be used for at least three days before retinoscopy is attempted. In the majority of cases the refraction is hyperopic, and is often associated with astigmatism.

Examine the eyes for strabismus while under a cycloplegic. Are the eyes parallel? Is the amount of strabismus as great as or less than before atropine was used? If you find the eyes parallel, you may be reasonably certain that the squint is very receptive to treatment, and the eyes will straighten out under the proper correction. If the squint is less than before the cycloplegic was used, it may be because of hypertrophy of the internal recti, and these eyes, too, in time, will straighten out under proper treatment. If the angle of strabismus is as great under atropine as before, the chances are that other additional methods besides glasses will be needed for correction.

After retinoscopy, prescribe the full amount of astigmatic correction with about a half diopter hyperopia less than the full amount found. Hitz[2] states, "The full correction of hyperopia in internal strabismus will often produce much greater reduction in the angle of strabismus than the correction in which one-half to three-quarters diopter is subtracted." It is preferable to subtract a half diopter, especially if the correction is the first one made, and later give a full correction if any squint still remains.

It is important that this non-operative treatment of squint should be begun as soon after the discovery of the condition as is possible, and glasses can usually be given a child as early as eighteen months. The youngest fitted in our practice was thirteen months, with a prompt correction of the squint.

The use of prisms ordinarily causes no improvement, and occasionally increases the amount of squint, as it weakens and reduces the effort to fuse.

Educational Treatment

Orthoptic training by the use of some type of stereoscope is very helpful to stimulate fusion, as this breaks up suppression, establishes diplopia, true projection, and stimulates binocular vision and stereopsis. Low degrees of strabismus may be corrected by orthoptic training alone. Within recent years, many new types of mechanical and box stereoscopes have been placed on the market. All have their good points. In our office, the Wottring Rotoscope is used and a vertical diplopia is established. This method is more prone to succeed than when an establishment of a horizontal diplopia is attempted. Orthoptic training is very useful before surgery. After operation, patients who have parallel visual lines, good vision in both eyes and true projection may be left to their own urge for fusion to develop binocular vision. Patients with residual deviation and suppression should be given orthoptic training until they have binocular vision with and without glasses. Many cases of latent suppression that respond very nicely to orthoptic training are found even in cases without squint.

Occlusion of the fixing eye, that is, occlusion of the good eye by a shade or occluder, is resorted to immediately or soon after the refraction. The good eye is covered with the hope of increasing the visual acuity of the poor eye, as well as to compel the poor eye to use such vision as it has to promote fixation, and to stop the habit of suppression.

Instillation of atropine into the good eye to blur its vision is not as satisfactory as using the occluder, as the atropinized eye often sees better than the poor, unatropinized eye.

Bar reading, or controlled reading of Javal where a bar or strip is placed so that only part of the page is seen with either eye, has been supplanted by most of the stereoscopes. The Wottring Rotoscope uses the bar principle.

About five years ago, I had the privilege of working with Dr. Fink and Dr. Bryngelson[1] of Minneapolis in their original research on the relation of stuttering and left-handedness to cross-eyes. Here was used a type of treatment for cross-eyes that occasionally is effective. A thorough history of left-handedness and stuttering was obtained in all cross-eye cases. If a child were found to be cross-eyed, or was stuttering, investigation often showed that the child was originally left-handed, and that the parents had at some time previously insisted and forced the child to use his right hand. All these children were made to use their originally normal left hand. Occasionally, the right hand had to be tied, as they had become so proficient in its use, and in many cases, after variable lengths of time, the cross-eyes would begin to straighten out. Stuttering was also treated in this manner with other approved speech practice methods with good results.

Surgical Treatment

If the squint is of a high degree, 20 to 40 degrees or more, the treatments outlined heretofore are used, but, of necessity, there must be a mechanical and anatomic adjustment of the eyes, as it is impossible in some of these cases to turn the eye out far enough to hold the head straight. Operation must be resorted to in these cases, as well as in those that do not respond to the aforementioned treatment.

Operation is resorted to in these highly convergent squints to bring the eyes parallel, or nearly parallel, to aid the child in developing good vision, and at the same time to get a cosmetic result. In children of school age, it is not uncommon to hear them called "cock-eyed," and many other names, by their schoolmates. It is, therefore, also of psychological importance to correct cross-eyes by whatever means possible, as many of these children develop an inferiority complex if left alone. In older children and adults, surgery is purely for cosmetic reasons, as at that time it is impossible to develop fusion or to improve vision. Here, too, the cosmetic result is of great importance, especially in young women.

In children, operative treatment should not be undertaken until the refractive correction has been worn for at least six months, and the occluder and orthoptic treatments have been resorted to without results.

Types of Operations

No single strabismus operation should be used in all cases. In some, it is necessary to do a recession of the internal with an advancement or resection of the lateral rectus muscles. Occasionally, both eyes have to be operated upon before parallelism is obtained. The above surgical procedures may have to be repeated on the other eye, or a tenotomy and/or a tucking done on this eye at some future time. It is poor surgery to operate on both eyes at the same time. It is much better to over-correct than under-correct in convergent strabismus operations.

In divergent strabismus, one usually finds a myopic error of refraction. Here a full correction is immediately given with the idea of making the eye accommodate for near work, and by so doing build up a convergence power and straighten out the strabismus. A divergent squint, even of a small degree, is more noticeable than an internal one. Here, surgery must be resorted to more often and earlier, as in these cases we usually find a thin, weak internus muscle and tendon. This is advanced and occasionally one must do a recession of the externus muscle before parallelism is obtained.

In alternating strabismus with good vision in each eye, satisfactory results may follow careful tenotomy of the internal recti muscles. If a squint is still present, which cannot be controlled by glasses and exercise, and should there be a preference of the fixing eye with loss of vision in the other eye, as occasionally happens, the external rectus of the poorer eye may have to be advanced.

Irrespective of whether refractive, educational or surgical treatment is used, squint or cross-eyes should be subjected to continued care from as early a date as possible until satisfactory therapeutic results have been obtained. This is evidenced by a cosmetic result of parallelism of the visual axes, good vision, or a preservation or improvement of the vision in the squinting eye.

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EXPERIENCES WITH SISTOSAN, A NON-IRRITATING HEMOSTATIC*

ARNOLD SCHWYZER, M.D.

Saint Paul, Minnesota

THE intention of this paper is to report our experience with a preparation made by Dr. L. Pancaro of Sudbury, Ontario. He calls it sistosan (a contraction of two Latin words, *sisto*—I arrest, and *sanguis*—blood). It is an extract from over a dozen plants and roots: Rosemary, Centaury, Nettle, Cochlearia, Mint, Root of Arnique, Root of Oak, Assent, Angelic Root, Elm Root, Marjoran, Ipericon, Matico, and Origan.

From the beginning it should be stated that the weak point in bringing this subject before you is the fact that even the maker of this preparation cannot furnish any chemical analysis of the active principle or principles. This would entail perhaps insurmountably difficult chemical study. We do not even know which of the plants work the most. In these days when one is swamped by proprietary medicines, one is ready to discard such remedies without further trial in as much as our Council of Pharmacy has not yet given its judgment of the remedy.

On the other hand (and this is the reason I bring this matter before you) I must say first, that this hemostatic has helped me out of tight places too often to make me refuse to acknowledge its effect and my gratitude; and second, I know Dr. Pancaro, a former interne at St. Joseph's Hospital, to be a thoroughly sincere student and an unusually well grounded physician. He has made a great many experiments with the substance to determine the mode of action which seems different from that of other preparations. He reaches the conclusion that it stimulates the leukocytes toward a prompt giving off of their profibrin ferment. The compilation of the extract of the different plants and roots he received from his father, also a physician, who as a good botanist had devoted many years of research to this subject. I can vouch for the integrity of Dr. Pancaro whose primary desire in developing this preparation was not commercialism but the intense desire to save life. In this condensed report we shall have to omit the history of the development of the product, which he prepared as an aseptic and even slightly antiseptic solution. It does not interfere with wound healing in the least as you will learn from the case reports. Given internally the coagulation time was somewhat reduced. Administered intravenously up to 10 c.c. per day to a dog weighing fifteen pounds no untoward symptoms appeared.

A demonstration before a medical group at Ottawa was particularly impressive. A medium sized dog's carotid and internal jugular were cut half way through and by application of sistosan on cotton under digital compression, the hemorrhage ceased so that after removal of the cotton, the wound could be closed by a simple skin suture. This appeared almost fantastic, so that I wanted to see it repeated. Dr. Warner F. Bowers, assisted by my son, H. C. Schwyzer, kindly did so in the laboratory of the Surgical Department of the University of Minnesota on February 29, 1936. The dog weighed 17 kilograms. The carotid was about the size of an ordinary lead pencil. Let me now quote the notes made by Dr. J. C. Klein and myself at the time of the operation.

> "595 mg. of nembutal intraperitoneally had been given for anesthesia. The common carotid on the left side was cut one cm. lengthwise and about one-fourth of the way crosswise, forming a cross incision. Cotton soaked with sistosan was applied and pressed on. After two minutes pressure was released. After five minutes the cotton pledgets were removed, and there was no trace of bleeding. The vessel can be handled with forceps and still does not bleed. The vessel was then cut completely across with very profuse bleeding. Sistosan applied. After two minutes of compression bleeding diminished, and after three minutes compression there was apparently no bleeding. After five minutes the pressure was almost released, after six minutes released completely. Ten minutes after sectioning the vessel, we start to remove the pack. After fifteen minutes, the innermost cotton pledgets are lifted, when bleeding starts again. Renewed application of sistosan on the innermost pledgets with compression for one and a half minutes. Thirty-one minutes after the carotid had been cut the last pledget is removed. There is no bleeding. Wound closed without any ligatures, some sistosan being left in the wound. For the two experiments 60 cc. of sistosan were used in all. A subcutaneous injection of two c.c. of sistosan was made laterally on the neck beyond the wound, for later examination."

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*Condensed from a paper read before the Ramsey County Medical Society, Saint Paul, Minnesota, November 28, 1938.

On March 9, 1936, the dog which had appeared normal was killed.

> "Exploration of the wound showed some hemorrhage in the fascial planes of the neck extending to the larynx. The carotid artery was collapsed cephalad and did not contain a thrombus. There was no thrombosis of the caudad segment. Each cut end was surrounded by a firm coagulum to involve not more than 1 cm. of the vessel at the point of section. The point of subcutaneous injection was somewhat indurated. On opening the thorax, there was mediastinal hemorrhage down to the level of the heart, on both sides of the vertebral column. The subcutaneous tissues over the clavicles were also infiltrated with old blood."

Inasmuch as there was no hematoma present in the wound, the hemorrhagic infiltrations in the mediastinum were undoubtedly due to the manipulations of compression for hemostasis at the time of the operation and to absorption from the blood-imbibed wound.

After making this experiment I started to rely more on sistosan in my operative work, whenever it seemed advisable. Many times it was a great comfort to have an agent to combat diffuse troublesome oozing or free bleeding when access to the bleeding vessels was difficult or associated with danger. What struck me in clinical work as noteworthy was not only the promptness of clotting but the firmness of the coagulum and the dryness (comparatively speaking) of the blood-soaked gauze packs used for compression. Some of the colleagues to whom I have given sistosan have been much impressed by its value while others had had no real results. Those from whom I have received word will be mentioned in the report on the use of sistosan in different regions. If we consider that the substance acts simply in hastening coagulation and in rendering the clot more firm, it is readily comprehensible that in removing the gauze or cotton too soon, the clot which has become enmeshed in the gauze, is pulled out of the vessel and the bleeding recurs. At times we have found it of advantage in cases where bleeding recurred after removal of the gauze to exert a little pressure with a gloved finger moistened with sistosan or to make gauze compression on an interposed rubber dam.

The use of sistosan in a number of surgical cases will now be reported. I have used it personally over a hundred times. The cases will be arranged going down from the head to end at the extremities. All of my cases reported in this paper were operated upon at St. Joseph's Hospital.

Dr. R. T. Muller reports to me a case of an *endothelioma of the skull.* The growth, the size of a hen's egg, was exceedingly vascular. Bleeding was decidedly disquieting. Adrenalin and compression with very hot packs had hardly any effect, but after application of sistosan there was no bleeding when three minutes later compression was discontinued. Dr. Muller thinks the sistosan saved the patient.

Dr. Livingstone of Hudson, Wisconsin, used sistosan in a case of *persistent bleeding after a tooth extraction.* The bleeding stopped permanently after cotton soaked in sistosan was applied and the patient instructed to keep his jaws closed for half an hour.

Bleeding *after tonsillectomy* was successfully treated in over eighty cases as reported by Dr. Pancaro. It may be of value to apply first a thin pledget of cotton and bulkier ones over it. Then the innermost layer may be left for an indefinite time after removing the outer ones.

Dr. Sprafka of Saint Paul reported on a child eight years old. Hemorrhage from the wound occurred six days after tonsillectomy. Adrenalin and tannic acid checked the bleeding temporarily only. Sistosan applied with pressure for six minutes stopped bleeding permanently.

In a case of *parotid tumor,* sistosan combined with firm compressure for three minutes checked troublesome bleeding. Healing was perfect.

Carcinoma of submaxillary area.—This patient had a large metastatic carcinoma of the submaxillary area from a growth on his lip which had been treated by his home doctors with large doses of x-ray and radium since November 1935. He came to us in April 1937. The mass was removed *in toto* together with the overlying skin and the adjoining muscles, including portions of the sterno-mastoid muscle. Oozing was marked, though not excessive. Sistosan checked it effectively. Later a pedunculated flap was formed to cover the defect.

In *goiter work* there may be a rare instance where sistosan comes in handy. Dr. A. E. Naegeli of Saint Paul asked me for some sistosan when serious bleeding occurred in a thyroidectomy for a toxic goiter. The gland appears to have been very friable, sutures pulled through and tying was difficult. Pressure with ordinary gauze checked the hemorrhage only partly, but ten minutes after applying gauze soaked with sistosan the bleeding was controlled.

I have records of four personal cases of thyroidectomy where the lotion was used. In one of them for instance there was a bleeder on the right side of the trachea where fear of interference with the recurrent laryngeal nerve made us apply some sistosan. The bleeding stopped. Recovery was prompt.

Carcinoma of the thyroid gland.—Profuse free bleeding and oozing occurred on removal, July 13, 1937, of a right sided tumor which was firmly adherent to the surroundings. Sistosan checked the bleeding effectively.

Gastric bleeding.—Dr. Pancaro speaks of good effects from internal administration. In one of our cases of marked, though not severe bleeding after gastro-enterostomy, the vomiting stopped after administration of three tablespoonfuls, and the further course was smooth. How much of this was due to the sistosan remains questionable, but it shows that the stomach accepts sistosan without revolt. In two other cases (one of my own and one of Dr. Naegeli's) of profuse bleeding with no preceding operation, sistosan did not help. Local application and compression is here out of the question.*

Oozing from liver surface after cholecystectomy.—Of four such cases two could be closed tight. The other two had abscesses between the gallbladder and the liver and were therefore drained. Smooth recovery took place in all four.

Trauma, ruptured pancreas and mesenteric vessels.—Dr. Naegeli had a case of crushing injury to the abdomen caused by a one thousand pound weight. The hemorrhage was profuse retro-peritoneally and could not be checked by ordinary means. A gauze pack soaked in sistosan was used and the hemorrhage was controlled. At the autopsy three days later no hematoma was found. The bleeding had therefore been checked definitely.

A rapidly growing *sarcoma of the mesosigmoid* the size of a man's head was removed May 2, 1936. The bleeding was of course profuse. After removing the tumor as expeditiously as possible a gauze soaked in sistosan was introduced, and the parts compressed. After that the edges of the lateral leaf of the mesosigmoid were re-approximated by suture and the abdomen closed tight. Uninterrupted wound healing followed.

A patient with *intestinal obstruction* due to widespread *post-operative adhesions* involving almost the whole tract of the small intestine after operation elsewhere for an ovarian dermoid and reoperation for adhesions, came to us and was operated upon November 25, 1936. Small intestine loops were so firmly grown to the abdominal walls at the site of the former incisions that we barely missed opening the gut in several places. One loop had a fibrous attachment to the depth of the pelvis at the site of the stump of the ovary. The patient was so extremely emaciated and weakened that only the worst and obviously obstructing parts could be freed. We predicted that we might have to do more later on, as the omentum was not to be had for protection. Considerable sistosan was used on the oozing gut and some was left in the peritoneal cavity. Recovery was very prompt. Fifteen days after the operation she came to the office, and my associate made the entry that she had gained ten pounds since the operation. She felt pretty well for three months when in March unbearable cramps recurred and became so severe that she had to be reoperated on May 17, 1937. Since then she is reasonably well though she often has much pain. At our second operation, the fourth one for the patient, firm adhesions had been encountered at the abdominal walls and in the pelvis though not near as bad as at the first.

I am under the impression that sistosan does not make adhesions, on the contrary in checking the oozing, counteracts the formation of such. We have used it many times in pelvic work leaving 30 or 50 c.c. in the peritoneal cavity if it seemed desirable on account of much oozing, as in several advanced malignant tumors of the ovaries when the soft growth had broken through the surface and adhesions were present with many oozing areas. As a striking example let me report in short, one case. A Catholic Sister was operated upon on January 21, 1937, for a *sarcoma of the ovary* involving the tube. Her hemoglobin was only 50. It was decided to transfuse her not before but directly after the operation. The tumor, about the size of a six year old child's head, was adherent to loops of small intestine all over the sides and posterior circumference. We first freed one loop and the bleeding was excessive from the junction between mesentery and gut as well as from the tumor side. Compression by doubling up the gut on its mesentery only partly reduced the bleeding. It appeared that we should lose the patient unless we succeeded in freeing the mass quickly from all the loops of intestine (six or eight of them) and could then stop the bleeding. There was, of course, no time to be lost tending to individual bleeders. As rapidly and gently as possible we separated the tumor from the many loops. Sistosan was poured into the wound and while we proceeded, compression was made as well as possible. The pedicle was reached, clamped, and the tumor cut away. Now more effective compression of the mass of raw oozing guts could be accomplished with large sistosan-soaked packs. This controlled the bleeding reasonably well. The other ovary was then looked for. It was the size of a plum, white, and imbedded in adhesions. It was removed while compression of the guts was kept up. Another ounce of sistosan was poured into the pelvis and the abdomen closed. A transfusion of 660 c.c. of blood was then given, and the recovery was very good. Upon inquiry the patient wrote us April 10, 1938, that she had gained over forty pounds in weight and was feeling very well.

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*Since reading this paper sistosan was given internally in a case of severe gastric bleeding. A tablespoonful was administered every hour for three doses and followed with a teaspoonful every two hours for twenty-four hours. The hemoglobin had come down from near normal to 35 per cent within two weeks, and the feces seemed to be almost all blood. After sistosan, the feces became free from blood. Resection of the stomach (Feb. 24, 1939) then demonstrated a malignant mass with a deep ulcer an inch in diameter.

It would be too tedious to report on all the abdominal cases where sistosan was used, such as complicated carcinoma of colon and rectum or extraperitoneally developed fibroids between the layers of the broad ligament, or severely adherent adnexa, and several broadly adherent malignant growths, etc. Among minor things, there were two cases of viciously prolonged bleeding from simple punctures of small ovarian cysts, where sistosan checked the annoying oozing.

In *nephrolithotomy* we have used sistosan five times. One patient, Mrs. J. S., was operated upon February 1, 1937. Three stones were removed by incising through the cortex of the kidney. Sistosan was applied to check the bleeding.

Another patient, Mr. H. G. E., operated upon December 1, 1936, had a large branched stone and some smaller ones. They were removed through a cortical incision, three inches in length. The bleeding was stopped partly by sistosan with compression, partly by suture.

A third case of renal calculi was Mr. C. W. M. On November 30, 1937, a nephrotomy was made which allowed us to deliver a calculus 3.5 cm. long and a smaller, hard, white one. The bleeding was severe as we did not clamp the hilum for fear of crushing the stone. Sistosan on a gauze sponge together with compression for several minutes checked the bleeding enough for a suture under vision.

A fourth patient was operated upon March 11, 1938. Mr. J. A., a strong man of forty-one years, had a complete obstruction from a stone at the uretero-pelvic junction. The temperature was 104 degrees and there was so much peripyelitis (the tissues being baked together at the hilum) that a moderate sized cortical incision was made through which some smaller concretions were first removed from the lower calix and then the conically shaped calculus from the pelvis. Due to the small size of the incision (about 4 cm.), the vessels could not be satisfactorily sutured in the depth, and the sistosan together with compression was used.

These four patients made good uninteruped recoveries following nephrotomy. In the meantime we had other nephrotomies where we did not have to use sistosan. But in this kind of operation one is especially glad to have an agent for controlling bleeding. Of particular interest was the fifth case.

This patient was operated upon very recently. Besides a large stone there were smaller ones up to the size of a french pea and in the lower calices much fine gravel. This case is of particular interest for the discussion of sistosan, as *in some other way* we made use of its quality of forming a firm coagulum. After the removal of the large stone through the open kidney and after the scooping out of the more sizable of the smaller calculi there was a great amount of gravel to be felt. The kidney pelvis readily filled with blood as an almost cartilaginous perinephritis and the fear of forcing the material into the ureter had made us desist from clamping or constricting the hilum. A sistosan-soaked gauze sponge was inserted into the kidney pelvis and left for a while. A firm clot formed in the calices and was, of course, more adherent to the gauze than to the smooth lining of the calices. When the gauze was removed a large number of small stones came away with it and after repeating the procedure once more, the finger could not detect any grit anywhere. The firmness of the clot formation and the non-irritating character of the sistosan were particularly helpful in this case.

Mrs. S. G. was operated on February 18, 1937 for a *solitary cyst of the kidney.* It was on the posterior surface, about midway between the two poles and was the size of a tangerine. It was cut out of the parenchyma, sistosan was applied and the kidney wound approximated by sutures. Recovery was prompt.

Suprapubic prostatectomy.—Even when there is very little bleeding after the enucleation of the prostate, we always compress the bed with a sistosan-soaked gauze or a piece of rubber dam after sistosan is poured into the bladder. Sistosan seemed very valuable in this work, but to say that it was the deciding reason for having lost only one case in our last forty-two suprapubic prostatectomies would not be correct as the large majority were before we had sistosan. Compared with other cases there was, however, less bleeding after the operation. Since we have used sistosan, the urine was as a rule macroscopically free from blood within one or two days. I will mention just one case where we removed the prostate suprapubically and at the same session excised a large *diverticulum of the bladder.* In 1933, a year before he came to us, a well known urologist had made a transurethral operation for prostatic obstruction, but when some difficulty arose, had to open the bladder suprapubically. A diverticulum of the bladder had been recognized before operation. The patient consulted us in March, 1937, and had much misery and urgency. There were 400 c.c. of very foul residual urine. After washings and silver nitrate treatments, the residual quantity was reduced to 275 c.c. and was of considerably improved quality. On March 13, 1937, we re-opened the bladder suprapubically and made an enucleation of the very hard prostate. Sistosan was applied and the bleeding was well stopped. Considering the number of operations the patient had had to go through, together with his mental and financial circumstances, we decided to remove the diverticulum at this same session, though it appeared difficult of access. It was almost directly back of the bladder, a little to the left side and the roentgenogram had shown it to be about four inches in height. The left bladder wall was freed. The left ureter ran over the side of the diverticulum and had to be dissected free. After the diverticulum was removed and its opening into the bladder closed, sistosan was poured into the bladder. Recovery was surprisingly prompt. I doubt whether I should have had the courage to have operated in one session without the help of sistosan.

Operations on the *extremities* where we used sistosan were only few in number.

A *varix aneurysmaticus* of the wrist in a boy of seven years was operated upon. Obliteration by suture was done but bleeding was not checked completely. Rather than do more suturing, sistosan was applied and after forty seconds there was no oozing even on straining. The wound healed promptly.

Dr. Pancaro reports good result in fifth day hemorrhage from wounds, in other words, in cases of a septic melting down of the primary thrombus in open wounds. In one such case we have to register a failure. A boy had received an injury to his wrist from an explosion of a shell. His doctor explored the wound for one and a half hours trying to find a piece of metal which the roentgen picture showed. The bleeding was so persistent that he finally had to quit and pack the wound. But alarming bleeding recurred repeatedly on successive days, and I was called in consultation. The curled up piece of shell was found directly over the carpal bones underneath the tendons. Sistosan was applied for a short time while the tourniquet was removed. There was no bleeding and the wound was partly closed. The patient left the hospital but was brought back in a hurry a week later on November 26, 1937. A renewed severe bleeding had occurred. After enlarging the wound and removing a hematoma the size of a chicken egg, the spurting ulnar artery was ligated and also another smaller one. Sistosan was applied and the wound partly closed. From then on the wound healing was smooth.

An *amputation above the knee* for *senile gangrene* did not need a single ligature, though for safety sake a fine catgut was placed around the thrombosed femoral vessels. The bleeding points were simply compressed for a few minutes by gauze soaked in sistosan. This controlled all bleeding. One might think that perhaps such a foreign substance would endanger the very poorly resistent tissues as a stump of amputation for senile gangrene. However the wound healing was perfect, and the lack of ligatures in the wound was a point in favor of such procedure.

That sistosan does not damage the tissues is best demonstrated by the good result we had in two cases of *skin transplantation.* They were for *varicose ulcers of the leg.* After excision of the ulcers and their thickened base, bleeding was not promptly stopped by ordinary compression. Sistosan was then used. The thin Thiersch flaps took perfectly.

So far we have not had any experience in cases of blood dyscrasias, a field which might yield valuable results inasmuch as Dr. Pancaro reports that he injected the fluid intravenously up to 10 c.c. per day into a dog of fifteen pounds, without untoward results.

Sistosan seems to have a good effect even if administered orally as in some cases of menorrhagia, but my intention was to bring before you only what I have observed myself. I am sure it has helped me out many times in dangerous conditions and very often brought at least a sense of greater security when extensive intraperitoneal oozing was disquieting. As it appears to me, the value of sistosan consists of causing the blood to clot more rapidly, and principally of an apparently better contraction of the clot as expressed in its dryness. The clot is more firm as demonstrated by the observation that the thrombus which blocks the cut vessels is not far progressing in the lumen, but nevertheless stops the bleeding effectively.

Some of my colleagues, it must be said in fairness, had no demonstrable results with sistosan, but I wonder if the time of compression was not perhaps too short or if it was not used where the remedy had no proper chance to come into contact with the vessels. I am inclined to say that in order to get results one must have the courage of the conviction that sistosan will work if it can be given a proper chance. Where clots hinder the remedy from reaching the vessel lumina we cannot expect much. Recently a case of severest nose bleed where the blood gushed forth like from a small aneurysm and the patient was brought to the hospital cold, clammy, and practically pulseless, neither sistosan nor "tuffon" in connection with firm packing of the nares from behind and in front after application of trichloracetic acid, controlled the bleeding more than temporarily. Ligation of the external carotid had to be resorted to.

Dr. Pancaro contends that results were observed in hemoptysis and in hematuria. As the *post hoc* is not necessarily a *propter hoc,* and as I have not had occasion to use sistosan in such cases, this is only mentioned in passing.

Several hemostatics are on the market. Already long ago Fonio, a former assistant of Kocher, made a preparation from blood platelets in powder form, and called it *coagulen.* It was of good help in some cases of mine and of several of my colleagues. It is applied in powder form. We did not feel safe to use larger quantities in the abdominal cavity.

A similar preparation in liquid form seems to be the recently advertised *"ercé,"* a lipo-colloid suspension of thrombin. It comes in ampoules of 5 or 20 c.c. Like Fonio's coagulen, this French preparation may be said to act physiologically in bringing to the fibrinogen in the blood, the agent—the thrombin—which causes coagulation under usual conditions. Ercé is claimed to coagulate blood in twenty sconds. I have had no experience with it.

Another preparation is *"tuffon,"* a German product which I saw used with prompt effect by Prof. Henschen of Basel in Switzerland this past summer. In one of our own cases bleeding from the bone marrow in an amputation of the leg was promptly checked. A firm rubbery mass promptly formed of blood and this coagulant, which contains among other things, tragacanth.

You heard recently of the vitamin K (Koagulations-vitamin) as opening possibilities in hemorrhagic diatheses. The experiments with several other preparations demonstrate the urgent desire for a reliable hemostatic.

Sistosan, in its liquid form, harmless even in large doses in the peritoneal cavity, has advantages of much merit. To claim too much for it would hurt its use. I would not trust too much any remedy in a treacherous case but one thing is sure: I should not like to be without this preparation. It has proved itself too often a good friend in need and I feel very grateful to Dr. Pancaro for this efficient and innocuous hemostatic.

HISTORY OF MEDICINE IN RAMSEY COUNTY

BY J. M. ARMSTRONG, M.D.

(Continued from March issue)

1865

A number of physicians came to Saint Paul in 1865 apparently to look over the prospects. Among them were Samuel D. Flagg and Albert E. Senkler. The former moved to Saint Paul permanently the following year, and the latter settled at Saint Cloud and moved to Saint Paul in 1880. Both became prominent in local and state medical affairs in later years. Of interest to residents of old Saint Paul was a petition made by Dr. Rosenk to the common council in March. He stated himself to be the owner of the lot on which the Bell Tower was situated and petitioned to have one hundred dollars appropriated for ground rent since the year 1860. This lot was the small triangular piece bounded by Ramsey, Sherman, and West Seventh Streets. The bell in the tower was rung to mark the working hours and was used also as a fire alarm. Many persons now remember the tower; the bell was removed to the old market house on Seventh and Wabasha Streets.

The Saint Paul Fire and Marine Insurance Company was organized this year with Dr. David Day as president. The reported discovery of gold along the northern boundary of our state caused considerable excitement at this time, and several gold mining companies were organized. The first of these was the Vermillion Falls Gold Mining Company, of which C. Draper Williams was president. Apparently C. D. Williams was a good enough name for a physician, but C. Draper Williams was more impressive on a certificate of gold mining stock.

The salary of the city physician was cut to $150 per annum; inasmuch as gold was quoted at 135 at this time, economy seemed necessary, and as usual the physician suffered. The county commissioners purchased for $1,000 the S. W. ¼ of the S. E. ¼, Sec. 21, Town 29, Range 23, for a poor farm. The only other references of importance enough to note concerning physicians are that on October 3 the funeral of Dr. Ebenezer Miller took place and on the next day the furniture of Dr. Dorphey was sold at auction at his rooms in the Rogers Block. This is the only reference that has been found concerning the latter. It is also stated that on October 8, Borup and Chaplin shipped out six tons of ginseng worth 75 cents a pound.

In November, the board of health was reorganized with Dr. Brisbine as president. He appointed as ward deputies Drs. Steele, Wharton, Willey, Stewart, and Potts. In December Dr. Morton returned from his army service and resumed practice.

It was during this year that Hatch's Battalion captured the two Indians, Shakopee and Medicine Bottle, near Pembina. The captives were brought to Fort Snelling for trial, were convicted and hanged. The story of their fate afterward is best told by quoting from the *Pioneer* for November 16, of the following year.

> About a year ago Shakopee and Medicine Bottle were hanged at Fort Snelling. That night about the bewitching hour of 11 P. M. a light might have been seen through the window of a drug store not many miles from the corner of 7th and Jackson Sts., and the rotund form of Dick C—— (we omit names) busily engaged in packing Mr. Shakopee in a cask of spirits. The next chapter in the romance was an item in a Philadelphia paper stating that Shakopee's body had been received and duly dissected at a medical college in that city. But what of Mr. Bottle? We suspect the Ramsey County Medical Society can tell what became of his flesh. As for his skeleton, we saw it in the office of a surgeon down street the other day, and a fine framework of bones Mr. Bottle had, too.

The editor anticipated the founding of the Ramsey County Medical Society by three years. He probably referred to the Saint Paul Academy of Medicine and Surgery. That society suspended sometime in 1866. At any rate, one must give the editor of the *Pioneer* the credit of naming the Ramsey County society even before its conception.

1866

The outstanding event of 1866 was the reappearance of Asiatic cholera in Saint Paul. The ravages of the disease and the efforts made by the board of health to cope with it are considered in a separate chapter, and will not therefore be described here.

Dr. Morton, who had returned from army service late in 1865, died in Saint Paul on March 22, and the papers gave a long account of his army services and his career. He was the first of the group of medical men who came to Saint Paul in the previous decade to pass away. The papers also recorded, on January 27, the death of Dr. Hiram Murdock, at the residence of Dr. Henry Murdock in Taylor's Falls. He was born in New York in 1797. He was the father of Judge H. L. Murdock, of Saint Paul. The papers stated that he was formerly a resident of the city, although there is no record that he ever practiced his profession there.

Early in the year the Cosmopolitan Hotel at Third and Franklin Streets burned, but the stone walls remained standing until the night of June 25, when a violent wind storm blew them down, demolishing the house next door, which was occupied by Dr. Schell. It was feared that the doctor was killed, but those who started to clear away the ruins were encouraged by a flood of expletives in his well known voice. When he was extricated, it was found that his left leg had sustained a compound fracture which confined him to bed for some months.

In February Dr. Tavenier, who had been away for some years, returned to Saint Paul. Dr. D. W. Hand returned from army service in June and resumed his practice with Dr. Willey, and Dr. Thomas Foster also returned. Dr. Vaiden, who had been in Saint Paul since 1854, moved to Prescott, Wisconsin, where he purchased a large tract of land. Dr. Peter Gabrielsen, who had received his discharge from the army, evidently could not give up the fighting habit, and was twice arrested for assault and fined in the police court. For further particulars regarding him see the biographical section.

Among the new physicians who came to Saint Paul were Dr. Charles E. Smith, who had just finished a year of interneship at the Pennsylvania Hospital, after graduating from the University of Pennsylvania. He began practice with his father, Dr. Franklin R. Smith. Dr. James T. Alley, a homeopathic physician, came from New York. He obtained considerable practice and died in Saint

Paul September 17, 1878. A Dr. Edward Wietfeldt also arrived during the year but remained only a short time. Dr. Cyrus Brooks left the army and became a sanitary inspector for the second ward. Dr. Samuel D. Flagg became a permanent resident, probably shortly after the beginning of the year. In March he was appointed by the governor to the board of managers of the state lunatic asylum, a newly created board. Dr. J. V. Daniels, of Saint Peter, was president, and Dr. Flagg, secretary. Several itinerant medical practitioners spent a short time in Saint Paul as in previous years, but their names are not important enough to record.

An income tax was passed by Congress at this time and it may be of interest to record the incomes of some of our medical men. Incomes over $600 and under $5,000 were taxed 5 per cent, and over $5,000, 10 per cent. The amounts given include the $600 exempt.

A. G. Brisbine	$1,208.00
Wm. Caine	900.00
David Day	1,462.00
Samuel D. Flagg	855.00
J. H. Murphy	1,000.00
J. H. Stewart	1,114.00
F. R. Smith	1,100.00
John Steele	1,174.00
T. C. Schell	959.00
Godfried Stein	674.00
C. D. Williams	1,535.00
H. Wedelstaedt	725.00
Alfred Wharton	1,028.00
Samuel Willey	1,098.00

These amounts probably represent the total income. The returns show that there were only 475 persons in Ramsey County with incomes over $600 and only 206 in Hennepin County. Day was in the drug business at that time and Stein was also a druggist. The last named lived in Saint Paul many years and finally returned to Germany. Dr. George Stein, a son, is now practicing medicine in Munich.

The ginseng business in 1866 was slightly in excess of that of the previous year, as 89,523 pounds were shipped out of Saint Paul. It was ginseng that stimulated the trade with China and which resuscitated the country after the Revolutionary War, and it seems fair to believe that this trade helped the residents of Minnesota after the Civil War.

The Saint Paul Academy of Medicine and Surgery, which was organized in 1860, passed out of existence this year. There seem to have been several causes for its demise. Morton was dead and Rieger had moved away. The Academy lost the position of city and county physician and health officer which had been a principal source of income, though the emoluments of the position were greatly reduced. Most of the members had been away in the army during the previous years. Stewart and Wharton were at outs. Stewart and Murphy could not agree, as Stewart's ambitions were political and he was afraid of Murphy, who had much prestige among the ex-soldiers. It was necessary also for the physicians to build up their finances and the Academy was expensive. In addition the organization was rather a closed corporation and new men who had arrived in Saint Paul thought they ought to be taken in, but their professional status had as yet not been determined. Finally a meeting was held, the library was distributed by returning the books to their donors, the laboratory apparatus was sold, the balance of the funds was expended for an elaborate banquet, and the Academy was thus "liquidated and dissolved."

1867

In a summary of the previous year's health, the papers stated that 1866 had been the healthiest in the history of the city and suggested that the cleaning up of the city again be undertaken. In April, Brewer Mattocks was elected city physician and a general cleaning up of the city was begun. The quarantine station at Pig's Eye was equipped for use, should an emergency arise, and the smallpox hospital was moved to that locality. The mortality statistics showed that 272 deaths had occurred in Saint Paul the previous year. The population was between fourteen and fifteen thousand. This year the legislature passed general regulations for the reporting of births, deaths, and contagious diseases, which were almost similar to those put in force in Saint Paul the previous year.

One of the most interesting events in Saint Paul history, and of international aspect, occurred this year. The trial of one "Dr. George L. Van Solen, M.D." for the murder of a Dr. Harcourt. Harcourt was an Englishman and resided in Saint Louis. In 1865 he came to Saint Paul and went on a hunting expedition with Van Solen. Van Solen returned alone saying that Harcourt had deserted him. Nothing was thought about this event till 1867, when Harcourt's relatives in England, not having heard from him, asked the State Department to investigate his disappearance. It was then remembered that in 1865 a body had been found in the river at Pig's Eye with a stone tied to the neck, evidently a murder. Van Solen was found in Chicago, arrested for the murder of Harcourt and tried in Saint Paul. This was the longest and most expensive trial held in Saint Paul up to that time. The first trial ended in a disagreement; after a second trial, in 1868, Van Solen was acquitted. The prosecution was unable to prove that the exhumed body was that of Harcourt. Every physician in Saint Paul testified in the trial, but as the exhumed body was badly decomposed, their testimony was somewhat at variance. It was brought out at the trial, however, that Van Solen was a self-styled physician, a mechanic by trade, but that he had been a hospital steward in the army under Dr. Wharton.

In May, Dr. Brisbine was elected county physician, but in June the county commissioners again declared the office vacant and elected Drs. Murphy and Wharton to fill the position. The first reported malpractice suit against a physician occurred this year, Dr. Stewart being the victim; the jury found for the defendant.

A large number of physicians and so-called physicians came to Saint Paul in 1867. The majority remained but a short time, and were cancer specialists, magnetic healers, venders of spectacles, corn doctors, and the like. A Dr. H. Willson who had been surgeon to the Sixth Regiment essayed the practice of medicine in Saint Paul after practicing at Chatfield for a short time before the war. A Dr. N. Stanton, also, who stated he had had an extensive experience with cholera in 1851, and who gave Drs. Hill and Lindley of Minneapolis and Drs. Stoneman, Talvert and White of Saint Anthony as references, remained a short time. A Dr. Clark of Troy, New York, a homeopath, attended to Dr. C. D. Williams' practice during the latter's absence from the city. Dr. E. Herman Smith, a young man of great promise, who had just served an internship at Bellevue Hospital, New York, came to Saint Paul at this time largely because of his health. He became very popular and was one of the founders of the Ramsey County Medical Society in 1870. He returned to his home in Massachusetts early in the next decade and died there of tuberculosis. Dr. William Ray came to Saint Paul this year. He also was one of the founders of the society. Dr. Thaddeus Williams, of the Galenic Institute, moved temporarily to Janesville, Wisconsin, to open a drug store. The papers stated that he wrote literary articles under the name of Gordon Revere, and was the author of the article on the climate of Minnesota in Colonel Hewitt's immigration pamphlet. He left his younger brother, Dr. Cornelius Williams, in charge of the Galenic Institute for two years.

On February 14, 1867, the Minnesota Homeopathic Institute was incorporated in Saint Paul, with Dr. H. Wedelstaedt as incorporator and secretary. The officers were: C. D. Williams, president, St. Paul; W. H. Leonard, first vice president, Minneapolis; Z. B. Nichols, second vice president, Faribault; H. Wedelstaedt, recording secretary, St. Paul; T. R. Huntington, corresponding secretary, Minneapolis. The Board of Censors was composed of: J. N. Wheat, T. R. Huntington, and J. T. Alley.

The manuscript minutes of this society for the years 1867 to 1884 and from 1906 to 1912, when it dissolved, may be found in the Library of the Minnesota Historical Society.

It may be of interest to give here the incomes of some of the Saint Paul physicians as filed for the year ending May 1, 1867. The amounts include the one thousand dollars exempt.

David Day	$1,223.00	F. R. Smith	$1,955.00
S. D. Flagg	1,497.00	J. Steele	1,157.00
D. W. Hand	1,509.00	A. Wharton	1,600.00
J. H. Murphy	1,500.00	Samuel Willey	1,354.00
Russel Post	3,794.00	C. D. Williams	1,479.00
J. H. Stewart	5,250.00		

1868

Other than the Van Solen murder trial already mentioned there seems to have been little of medical interest going on in Saint Paul this year. The usual number of advertising doctors were in evidence, who after blatantly advertising their phenomenal skill, remained for a short time and then passed on to other fields. Among the physicians who settled in Saint Paul more or less permanently were Martin Hagan, who may have come late in the previous year, and Adelard Guernon, a French Canadian, who succeeded to Dr. Vervais' practice, Vervais having died from an overdose of morphine on October 10. Hagan did well and remained a number of years. Both he and Guernon were admitted as charter members of the Ramsey County Medical Society.

Two homeopathic physicians, Dr. J. B. Hall, of Cleveland, Ohio, and Dr. B. J. Adams, chose Saint Paul for their field of endeavor. Also recorded as residents of Saint Paul are Dr. C. A. Glidden and Dr. Henry H. Eames. The former, a homeopath, remained about twenty years; nothing is known of the latter. Another man whose history is unknown is of more than passing interest. On October 23 the *Pioneer* published the card of Dr. P. Ronning, Norwegian physician, Office 130 Third Street. The name in another place is spelled Roëning. As he was the first of his nationality to practice medicine in Saint Paul, it would be desirable to learn more about him. Apparently he remained but a short time. The papers also recorded the death from apoplexy of Dr. Wm. P. Lambert, U. S. A., on April 28, at the home of his brother, Judge Lambert. Two Drs. Lambert have previously been recorded as practicing in Saint Paul and apparently they were all related. This Dr. Lambert was stated to have been born in Huntington County, Pennsylvania. He was fifty-three years of age at the time of his death, and had been a surgeon in the army and navy since the age of twenty. He probably was not a resident of Saint Paul. Drs. Stewart and Mattocks dissolved partnership at the beginning of the year, and Dr. C. E. Smith was elected county physician in June. M. G. T. Daly, son of Thomas Daly of Saint Paul, graduated in medicine at McGill University in May.

The incomes of some of the Saint Paul physicians for the year ending May 1 is given as follows:

A. G. Brisbine	$1,100.00	John Steele	$1,856.00
David Day	1,230.00	J. H. Stewart	5,530.00
D. W. Hand	1,356.00	F. R. Smith	1,636.00
Brewer Mattocks	1,339.00	A. Wharton	1,700.00
J. H. Murphy	1,500.00		

It is interesting to compare these figures with those of previous years. Apparently the practice of medicine was not very lucrative but of course the overhead costs were low in comparison with those of today. Stewart always managed to hold some lucrative office which added to his income from medical practice. C. P. and D. R. Noyes came to Saint Paul this year and took over the wholesale drug business formerly owned by Vawter, Pett, and Moulton.

1869

The year 1869 was an important period in Minnesota medical history. The earliest event of the year was the organization or reorganization of the Minnesota Medical Society under the name Minnesota State Medical Society. The call for the meeting was published in the Saint Paul papers on January 20 and 21, as follows:

> Minnesota Medical Society
>
> A meeting of the Society will be held on Tuesday, February 2nd, 1869, at the International Hotel in St. Paul at 11 A. M. County and City Medical Societies throughout the state are requested to send delegates.
>
> Business of importance will be presented.
>
> Thos. R. Potts, M.D.
> F. R. Smith, M.D.
> J. H. Stewart, M.D.
> A. E. Ames, M.D.
> J. H. Murphy, M.D.
>
> Minnesota papers please copy.

The meeting was held as announced on February second and third. Two paragraphs from the *Pioneer* of the third regarding this meeting may be quoted.

> About two years before Minnesota became a State, that is in December, 1855, a State Medical Society was organized in Saint Paul, by adopting a constitution and by-laws and the election of the following officers:
>
> President—Dr. T. R. Potts
> Vice President—Dr. J. H. Murphy
> Recording Secretary—Dr. J. V. Wren
> Corresponding Secretary—Dr. J. D. Goodrich
> Treasurer—Dr. David Day
> Censors—Drs. W. H. Morton, F. R. Smith, J. H. Stewart, A. E. Johnson, and A. E. Ames.
>
> Two subsequent meetings were held, the last being at St. Anthony in 1857. After that period the Society was allowed to languish.

In the account of the old Society to be found in this sketch for the year 1853, it is shown that whoever gave this information to the paper had a bad memory, as the Society was organized in 1853, reorganized in January, 1856, and that the names of the officers here given are those of 1857.

The history of our Minnesota State Medical Association, as it is now called, is not within the province of this paper, but it might be pertinent to attempt to surmise what the "business of importance" was which caused the call for the meeting. It is evident that the time was thought auspicious for securing the passage of a medical practice act by the legislature. This movement was successful, for on March 4 the legislature passed a law of six sections regulating the practice of medicine. We give here in abbreviated form Section I (see Samuel Willey in Medical Record, Vol. IV, p. 86, Apr. 15, 1869):

> "That it shall be unlawful for any person, within the limits of said State, who has not attended at least two full courses of instruction and graduated at some school of medicine within the United States, or of some foreign country, or who cannot produce a certificate of qualification from some state, district or county Medical Society . . . to practice medicine in any of its departments . . . within the said State of Minnesota."

It was hoped that this law would bar advertising quacks and irregular practitioners from the state. The promulgators of the law were disappointed. In the first place there was no adequate means of determining whether a diploma presented was forged or stolen, and furthermore, the country was overrun with obscure and inadequate medical schools and diploma mills. Lastly, and still more aggravating, was the fact, discovered after the law was passed, that the articles of incorporation of the Minnesota State Homeopathic Institute formed in 1867 gave that society the same right as a medical school of conferring the degree of Doctor of Medicine. While the gentlemen of this latter society were to be commended for their acuteness in securing this power, they were not acute enough to restrict the issuing of their diplomas to their own kind. Every quack who signified his belief or preference for homeopathic practice was welcomed with open arms, and they felt that their school of medicine was making great progress. The result was that the same men who worked to influence the legislature to pass this act worked just as hard to have it repealed at the next legislative session. This was done and Minnesota had to wait till 1883 before another Medical Practice Act was put on the statute books.

The meeting of the State Medical Society was held as stated at the International Hotel, which was on the corner of Seventh and Jackson Streets. The members retired on the third (no doubt well satisfied and tired out), but not to rest, for at five o'clock on the morning of the fourth the hotel burned. Drs. Hagan and Flagg, who were residents of the hotel, managed to save some of their belongings, and a dozen or more of the out-of-town physicians escaped with small or no losses and uninjured.

The state Medical Society was not the only medical society to organize this year, for the press published on May 20, "A call for a mass convention of Eclectic Physicians in Minnesota," as follows:

> "We, the undersigned, deeming it important to Eclectic Physicians of Minnesota and for the better procution (sic) of our principles, and the advancement of Medical Science, would request all physicians who hold to the Eclectic Practice of Medicine to meet with us at the City of Owatonna, Wednesday, the 26th of May, for the purpose of organizing a State Eclectic Medical Society.
>
> E. M. Morehouse — E. P. Kermott
> N. S. Culver — Thos. More
> L. F. Case — F. Lee."

(To be continued in May issue)

President's Letter

OUR Public Relations constitute a problem of great difficulty at the present time. The medical profession is more or less on the "spot"; the same thing happens at different epochs to any professional, business or labor group. At such times, propaganda comes into play.

Propaganda is justifiable, of course. As doctors, as citizens, it is not only our right but our duty to present our beliefs and we cannot deny to those who do not agree with us the same rights and privileges. The difficulty is that the medical profession has had no training in propaganda. Essentially we are practicing physicians, teachers, research workers or administrators, and propaganda is a separate specialty just as surely as any other activity in life.

Because of our inexperience and lack of training, we may at times show at a disadvantage in any conflict of opinion that comes to the attention of the public, whether over the radio, in the newspaper, in public meetings, and even in individual conversations with lay people. Still our viewpoints must be presented.

As stated before, propaganda in the right sense is an honorable and just procedure. Our best propaganda keeps continually before the public the fact that our primary interest is in the public health, that our primary work is the practice of medicine, and that our welfare is identical with the welfare of the people.

The County Officers' meeting recently held in Saint Paul was of unusual interest and merit in this connection. Representatives from the press, the radio, the Department of Public Speaking at the University were there, also representatives of other interests with whom we are constantly in contact. They gave their lay viewpoints; viewpoints which we must understand if we are going to make progress in presenting our own views. At times we do not agree with what such persons tell us, but we should get their viewpoints and it might be of great value to any county society to arrange programs of this kind.

The State Office is pleased over the commendatory remarks we are receiving on the program of the month. Doctors who have never before written to the State Office have requested material.

Our State Medical Association meeting will be held May 31, June 1 and 2. The first two days will be strictly scientific. We believe that the exhibits and demonstrations will be unusually good, as well as the program for these two days.

A Public Health Exposition will be held in conjunction with the meeting. Our associates in health, including the dentists, the pharmacists, hospitals, hospital administrators, nurses, the Minnesota Public Health Association, The Women's Field Army against Cancer, the State Board of Health, the State Board of Control and others will be represented. This Exposition is undoubtedly in line with our best type of public contact.

The program for the third day will deal still further with our public contacts. It will take the form of a conference on medical problems in which well-known lay and medical authorities from the United States and Canada will participate.

George Earl, M.D., *President*
Minnesota State Medical Association

EDITORIAL

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J. R. BRUCE

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SULFAPYRIDINE

MOST clinical investigators are of the opinion that sulfanilamide alone is of doubtful value in the treatment of patients with pneumococcus pneumonia. Therefore, much interest accompanied the announcement of Whitby in 1938 that a chemical compound closely related to sulfanilamide had proved effective against various strains of pneumococci. This new compound differed from sulfanilamide in that one hydrogen atom of the SO_2NH_2 radical was replaced by a basic pyridine group. Known in England as M & B 693, this product has been recently placed on the market in this country as sulfapyridine.

The new Federal Food and Drug Law prohibits the sale of any new drug until it has been adequately investigated clinically and experimentally. In this manner, sulfapyridine has been used at the University of Minnesota Hospital during the past six months. The drug was supplied by Merck and Company in the form of uncoated 0.5 gram tablets. Patients treated with sulfapyridine at the University Hospital included the following general groups: those with pneumococcus pneumonia, staphylococcus sepsis, and subacute bacterial endocarditis. Nearly fifty patients have been given the drug. For the purpose of the present discussion, the following observations have been made: the effect of sulfapyridine on the clinical course of pneumococcus pneumonia; in a few instances, its effect when combined with type specific antipneumococcus serum; the rate and degree of absorption of the drug from the gastro-intestinal tract; the determination of blood levels, including both the free and conjugated forms, and the relationship of these levels to the dose; and the toxic manifestations.

It should be emphasized that, at the present writing, type specific antipneumococcus horse and rabbit serums are the treatment of choice for pneumococcus pneumonia. This is particularly true for those cases with a lobar distribution, and those with a bacteremia. Serum is most effective when given in adequate doses and early in the course of the disease. There is some question as to whether sulfapyridine should be combined with serum therapy. In a small number of cases, specific rabbit serum and sulfapyridine have been administered to adults with a Type III pneumococcus pneumonia, and a bacteremia. The results have been disappointing, due, in part, to the advanced ages of the patients. On the other hand, Finland working at the Boston City Hospital has recently stated, "The action of sulfapyridine and its effect on the course of Type III pneumococcus pneumonia is being assessed. While it is yet too soon to draw final conclusions, the findings suggest that the combination of specific antipneumococcus rabbit serum and sulfapyridine exerts an optimum effect, both *in vitro* and in the patient."

It would appear from the observations at the University Hospital and elsewhere, that sulfapyridine is definitely useful in certain groups of patients with pneumococcus pneumonia. The first group includes young adults with minimal lung involvement caused by one of the higher pneumococcus types, and with negative blood cultures. They appear to do well following sulfapyridine therapy.

Likewise, there is evidence that the drug is of value in children over the age of two. The mortality rate of pneumococcus pneumonia in children of this age group is generally considered to be low, and there are indications that sulfapyridine therapy will be adequate for those cases without a bacteremia, and a limited involvement of one lobe. The drug has been administered to post-partum and post-operative patients who have had an atelectasis limited to a small area of one lobe and who have also had the signs and symptoms of a beginning pneumonia with small numbers of pneumococci of one of the higher types in the sputum. The blood cultures have been sterile. Under these circumstances, sulfapyridine has been given, and coincident with its administration the patients have improved. Occasionally, a patient is encountered having the classical signs and symptoms of lobar pneumonia, but the biological agent causing the disease cannot be isolated. Sometimes in these cases, sputum adequate for typing purposes cannot be obtained. Under these and similar conditions, one may be justified in administering sulfapyridine. It should be stated that in several instances when the drug was given to patients ill with pneumonia, it had to be discontinued because of toxic manifestations as described below. One of the outstanding features of serum treated patients is that when the temperature approaches normal they feel considerably improved. This is not so obvious in the sulfapyridine treated patient. The temperature may be normal, but the patient does not appear or feel well.

During the present winter, many cases of atypical pneumonia have been encountered, and, largely because bacteriological studies have not yielded a causative organism, the disease has been assumed to be due to a filtrable virus. Sulfapyridine has been given to these patients with no apparent benefit. Other cases with a consolidation of the lung due to a hemolytic streptococcus have responded well to sulfanilamide.

There is no definite rule concerning the dosage. It should be remembered that sulfapyridine is highly insoluble, and for that reason no preparation is available for parenteral injection. Whitby has recommended doses in adults of 5 grams within 12 hours, in lots of 2 grams, 2 grams, and 1 gram four-hourly, and then 1 gram every 4 hours, night and day. With this dose, a blood level of 8 to 10 mgs. of the free form may be maintained in most patients. Ten grains of sodium bicarbonate are given with each dose, and whether this is necessary, only further observations will tell. Approximately one-half the adult dose is prescribed for children between the ages of 2 and 12 years, and about one-third the adult dose for infants. Like sulfanilamide, children tolerate sulfapyridine better than adults. The foregoing doses may be continued for several days while the patient is febrile, and then after the temperature is normal the drug may be continued for two or three more days. If the patient is unable to swallow voluntarily, the drug may be administered through a stomach tube by grinding up the tablets and suspending them in water.

It has been found that sulfapyridine is absorbed more irregularly than sulfanilamide, so that it is difficult to maintain constant elevated levels in the blood. Furthermore, in the average patient approximately fifty per cent of the drug present in the blood stream is in the conjugated form. Because of the irregularity in absorption and the large amount that is conjugated (sometimes up to eighty per cent), it is necessary to carry out frequent determinations of the blood level for the free form. This is done by the same method as for sulfanilamide, except that sulfapyridine standards are used. The levels of the drug in pleural exudates and spinal fluids is approximately one-half to two-thirds of that found in the blood. The drug is eliminated from the body within 24 to 48 hours.

The toxic manifestations of sulfapyridine have not been as thoroughly studied as those of sulfanilamide. The outstanding toxic symptoms are nausea and vomiting, and such symptoms occur much more frequently than during sulfanilamide therapy. This vomiting may be a serious complication in a patient quite ill with pneumonia. In some individuals, the vomiting may follow the initial doses, but the patient may tolerate subsequent doses. Other frequent symptoms due to the drug are headache, anorexia, weakness, and a depressed feeling. Mental confusion has been observed. Although cyanosis, as a result of sulfapyridine therapy, had been reported by some investigators, the writer has not observed this phenomenon in any patient treated with the drug. Acute hemolytic anemia, leukopenia, and agranulocytosis have been reported as complications. Drug fever and dermatitis may occur. It is of interest that Whitby has stated sulfapyridine is less toxic for mice than sulfanilamide, whereas Marshall and his associates at Johns Hopkins University have found sulfapyridine more toxic for mice.

It would appear, for the present time at least, that it is more difficult to administer sulfapyridine to a patient than sulfanilamide because of the troublesome vomiting and its irregularity of absorption, and because its insolubility precludes its use parenterally. Although sulfapyridine is effective against the gonococcus, meningococcus, and hemolytic streptococcus, sulfanilamide is equally as effective, and may be administered with less difficulty. For the time being, sulfapyridine should be used only in those diseases where it has been found to be more effective than sulfanilamide. This includes pneumococcus infections and possibly staphylococcal sepsis.

PROGRESS IN THE CONTROL OF CANCER

The unknown horizons of cancer are being pushed back farther and farther through the three closely related activities of clinical diagnosis and treatment, research, and education. Each of these is making significant contributions to a wider understanding of the problems of malignancy. One of the most interesting aspects of the entire cancer problem is that practically every bit of additional information about the disease adds to the hopefulness of its eventual control as a major cause of death.

Realization by the medical profession that the diagnosis and treatment of cancer is no longer a one man problem is offering much additional hope to the cancer patient. The value of organized tumor clinics in general hospitals, nearly three hundred of which are now functioning, is bringing a better appreciation of the complexities of this problem in modern medical practice. These clinics offer help to the family physician who is often denied access to necessary diagnostic and therapeutic facilities; while to the cancer patient it gives the benefits of group consultations with those having the widest experience with malignant disease.

An additional advantage of the tumor clinic is its usefulness as a center for graduate study for all physicians within its sphere of influence. This is possible largely because of the increased number of cancer patients seen in comparison with the relatively small number of such patients seen in the average general hospital. The value of comparative methods of treatment can be established much sooner where large numbers of patients are seen. All in all, the tumor clinic offers the maximum of good service to the cancer patient and excellent opportunities for education of the physician.

In the field of research, some of the most significant contributions to our knowledge about cancer are being made in the sciences of biology, chemistry, physics, and genetics. The rôle of certain chemicals—now numbering approximately fifty with more being added at frequent intervals—in the etiology of cancer is now fully appreciated. The knowledge that cancer is primarily a biological problem concerned with the vital function of cell growth is stimulating research workers to focus attention on the cell to identify those forces responsible for malignant changes in the cell.

Cancer research today is concerned more and more with the chemical nature of cell activity and inquiry is being actively pushed in the field of biochemical investigations. Wide researches are under way to find those chemicals with the most potent influence on normal and abnormal cell activity.

The physicist is extending knowledge of irradiation therapy, with the result that increasing use is being made of this therapeutic agent in the treatment of malignancy both for curative and palliative purposes.

Studies in genetics have been confined largely to work with laboratory animals. The further this work progresses the more evident it becomes that vastly improved records of human cancer are essential if we are to know more accurately the influence of heredity on cancer development in the human race. Because the great majority of marriages bring about a dilution of the probability of transmitting cancer to offspring through susceptible parents, most geneticists are unwilling to go beyond recognition of the possible transmission of susceptibility to cancer in succeeding generations. Even though cancer may be proved to be conditioned by heredity, the rapidly expanding appreciation of the value of early diagnosis and prompt treatment will continue to offer much hope to the cancer patient and will more than offset such handicaps as heredity may impose.

The greatest advance in cancer education of the public has been the organization of the Women's Field Army of the American Society for the Control of Cancer. This organization now extends to forty-six states, of which our own was among the first to be included. Its objectives are to bring to the general public the known and accepted facts about cancer and methods for its control. The presentation of these facts by the medical profession to hundreds of audiences has caused thousands of persons for the first time to seek examinations to determine their freedom from this disease. It has caused thousands of others to replace their unreasoning fear of the disease with an intelligent caution toward this question.

The value of this educational program cannot be fully measured, but the medical profession is in a position to know better than any one else the results of this program as their patients come in increasing numbers with questions about this disease. Success of this educational work rests in large measure on full coöperation by the medical profession. As the objectives of periodic examination and recognition of the early signs of cancer become better understood, a fuller coöperation on the part of the physician will be expected.

The outlook for controlling the increased number of deaths from cancer in this state is becoming brighter. That fortunate time will be hastened in proportion to the coöperation that is developed between the patient and his physician. Education will reduce the waiting period by the patient in seeking professional advice and service. The physician will make his contribution by not delaying in diagnosis and treatment once the condition is brought to his attention.

Frank Rector, M.D.

Field Representative of the American Society for the Control of Cancer.

TUBERCULOSIS CAMPAIGN

EACH year an intensive nationwide campaign for the early recognition of tuberculosis is carried on, not only among the laity but with the medical profession. In spite of the marked reduction in mortality from tuberculosis in recent years, the fact that about two hundred deaths from the disease occur daily indicates the need for continued endeavor on the part of the public and physicians to detect the infection in its early and curable stage.

Early symptoms of fatigue, loss of weight, slight elevation of temperature, and cough, demand the tuberculin test and use of the x-ray if early infection is to be diagnosed. Cough in a young girl may easily be attributed to cigarette smoking and in individuals over sixty to chronic bronchitis or emphysema. These elderly individuals with active tuberculosis are a real source of danger to their young grandchildren. It is also well to remember that the mortality and presence of infection in the colored race is three times that in white people.

In Minnesota, the tuberculosis campaign is directed by the Minnesota Public Health Association and free literature is available to all physicians on request.

THE WAGNER BILL

THE Wagner bill, embodying the proposals of the Interdepartmental Committee appointed by the President of the United States, was submitted to Congress, February 28, 1939. If passed, it will involve the expenditure of millions of the taxpayers' money beginning with eighty million the first year and in ten years' time amounting to 850 millions a year, half of this to be in the nature of a federal subsidy to be matched by the states. This expenditure is proposed according to the provisions of the bill for expanding state programs for (1) child and maternal care; (2) general public health services and investigations; (3) construction of needed hospitals and health centers; (4) general programs of medical care; (5) *insurance against loss of wages during periods of temporary disability.*

It is generally agreed that government activity in health matters is necessary in the prevention of epidemics and in matters affecting the health of its citizens in the general sphere of prevention. It is also generally agreed that there is need for financial assistance from the states in the care of the tuberculous and insane and those afflicted with venereal disease where care of the sick is closely bound up with prevention of disease. The governmental units have, generally speaking, not invaded the field of curative medicine, except in the care of the indigent. One outstanding exception has been the opening of Veterans' hospitals to former veterans for the treatment of conditions in no way related to government service which was a gross trespass in the field of private practice.

Now, the federal government proposes in the Wagner bill to expand certain public health activities to which the medical profession, through its national organization, has agreed. But, in addition, the bill proposes the construction of hospitals and medical centers which are not extensions of present government activities, but will constitute competition with present private hospitals, which have in general had great difficulties in recent years to keep going. If the federal government provides funds for the construction and maintenance of hospitals, their placement and management will be subject to political control. We have but to review the history of postoffice construction and management to visualize what can happen in the case of hospitals.

Doubtless, some localities suffer from insufficient medical care. Is this, however, not a local city, county or state problem, rather than a federal one?

Most serious-minded citizens believe that the balancing of federal and state budgets is of present vital importance. If budgets are to be balanced, not only will present federal appropriations have to be scaled down to the tune of some four billions of dollars a year, but the government will have to resist the temptation to launch new and expensive innovations such as those involved in the Wagner bill.

The proposals of the Wagner bill are those made not by Congress, but by the President's Interdepartmental Committee at the so-called conference held last July in Washington. The members of the medical profession had scant recognition; business men who will have to largely foot the bill had no representation. The proposals make some emotional plea to the public. Who can vote against a measure providing for more medical care for mothers and children and face their home constituents?

Perhaps the optimistic can see some hopeful signs of retrenchment on the part of Congress in this vital matter of federal expenditures. The fate of the Wagner bill will afford some indication of the trend. It is not generally appreciated that our representatives in Congress are largely influenced by their constituents at home. Each voter has a duty and privilege which he should exercise now by writing his senators and representatives in Washington, and by inducing his friends to do the same, expressing his opinion that the Wagner bill should be carefully considered and greatly pruned before it is allowed to pass. Do it now!

"Lord Nuffield, manufacturer of Morris cars, and far-seeing student of the relation of theory to practical purpose, recently offered Oxford a million-and-a-quarter pounds for medical research. When the vice-chancellor formally accepted the gift, Nuffield ventured to increase it without warning to two million pounds. In donating this enormous sum, he emphasized the importance of providing permanently for scientific advance and direct application of these advances to medical practice.

"I have the story from a friend of Nuffield's that one of the things that led him to want to contribute to the work of the medical profession was an early meeting with that great Canadian, Sir William Osler, who was then Regius Professor of Medicine at Oxford. Sir William had brought his automobile into the Morris garage for repairs of an urgent nature. He hardly guessed that in the person of the alert young owner of the garage he was talking with the man who would do more than anyone else to further the ambitions which he had for medicine at Oxford. No doubt it was the cordial personal interest and humour for which the older man was famous that led the then Mr. Morris to see to it that the car was ready the following morning after a night of labour, and to remember a friendship thus begun.

"It is doubly curious that this great English benefactor should recall this small Oslerian incident in connection with his benefaction, for it has been recorded that the late John D. Rockefeller, Senior, who gave so generously to medicine throughout the world, conceived the idea of organized endowment of medical research after Osler's textbook of medicine had been called to his attention, with its searching tabulation of what was known and what was unknown in the treatment of disease.

"Hard on the heels of his own gift to medicine Nuffield set aside another million pounds to create a new college at Oxford to be devoted to political science."

—Penfield, Wilder: Medicine and other things. *The McGill News,* 20:16, 1939.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
W. F. Braasch, M.D., Chairman

MEDICINE IN MINNESOTA

An interesting picture of the status of medicine and the public health in Minnesota was drawn by committee chairmen and representatives of agencies concerned in the delivery of medical services at the breakfast session.

Brief statements are quoted below from the 500-word reports of these officials.

Dr. S. E. Gilkey, medical director, State Relief Administration: Medical care for relief clients in Minnesota is becoming standardized to a degree that is proving beneficial to the client, *without prejudice to the taxpayer or the health professions.*

Clarification Needed

Mr. B. E. Youngdahl, director of the Division of Public Assistance, State Board of Control: Considerable clarification is still necessary in our relief legislation if we are to achieve an orderly procedure in the provision of medical care for the needy. There is confusion due to the categorical system of relief and aid giving, due to the large number of government units involved, due also to two types of relief giving—the township and the county systems—and to the maximums set in the public assistance act.

Whatever proposals may be made to the legislature to clarify this situation, it is my belief that the free-choice-of-physician-principle should be maintained. The patience and coöperation of the medical profession has aided materially in the handling of medical care for the needy.

Compensation Costs Are Low

Mr. G. L. Stolte, deputy administrator of WPA in Minnesota: In the event of an emergency outside of work, WPA workers must depend upon supplemental aid from respective County Welfare Boards. In the event of injury in work status, necessary medical and hospitalization and compensation for extended loss of time from work is provided. Our record in compensation costs in relation to payroll expenditures is very low compared with the expectancy rating which would be set up in private activity. We have been averaging 50 cents for every $100 payroll and regular insurance rates for similar coverage through private channels would vary from $4 to $10, depending on the type of work covered. Medical and hospital expenditures to date have approximated $325,000, and, at our present rate of employment, averages about $9,000 per month. In other words, 60 cents in every compensation dollar goes for medical and hospital care. Care for WPA injuries is distributed as equally as possible among eligible hospitals and doctors.

Services for Crippled Children

Dr. H. E. Hilleboe, Director of Services for Crippled Children, State Board of Control: The program of the Division of Services for Crippled children carried out under medical direction, without political or governmental interference, gives real evidence of what can be accomplished by the medical profession in the field of public health and welfare for the permanent benefit of youthful citizens in need of care. The state register comprising orthopedically crippled children under 21 years of age in Minnesota included 9,094 cases on January 1, 1939. On July 1, 1937, there were only 6,039 cases on the register. A large number of new cases are reported by general practitioners through the field nursing and clinic service.

Fourteen itinerant field clinics are held each year throughout the state. This is one of the most effective means of finding crippled children early, of determining the need for care, following up treated cases locally and of public health education. Twenty-three per cent of the 1,264 examinations made in the clinics were new to the register, and predominantly in the younger age groups. The nursing and field service have been doing invaluable work in finding cases, in education and follow-up, in meeting the nursing and social needs which augment medical care given. When no beds are available in public hospitals, the youngsters have been hospitalized in private hospitals under the care of qualified orthopedic surgeons within the limits of funds available.

Since the start of the program in 1936 there have been 531 hospitalizations of 364 crippled children in private hospitals at the expense of the Division. During the biennium ending June 30, 1938, $31,188.43 was paid to orthopedic surgeons and consultants as fees for care of crippled children. This is over 19 per cent of the total budget of the division for the biennial period. Refresher courses have been held in county medical societies and in coöperation with the State Board of Health, the division has given a continuation study course for all public health nurses through the state involving 32 lectures at six centers.

Problem of Pre-Maturity

Dr. E. C. Hartley, director of the Division of Maternal and Child Hygiene, State Department of Health: It is worthy of note that while the infant mortality rate has shown a steady decline, most of this decline has taken place in the period following the first month of life, that is, from the second to the twelfth month. In the actual newborn period there has been far less change, and for the first day of life there has been no change at all. The medical profession and the State Health Department are concerned about this lack of improvement. Among the chief causes for these early deaths are found to be prematurity, birth injuries and congenital malformation. In other words, a great bulk of them may be effected favorably in two ways: first, by continually raising the standards of maternal care, and, second, by improvements in the care of premature infants.

New Program

Recently the State Department of Health in coöperation with the State Medical Association and with the State Hospital Association have planned a project aimed directly at improvement in the care of premature infants in Minnesota. The money for this purpose is part of the Social Security fund received by the State Board of Health from the Children's Bureau in Washington. The plan involves the training of a special pediatric nurse in the modern methods of premature care. This nurse has been selected and will receive her training under Dr. Julius Hess of Chicago, who has carried on a considerable amount of work among premature infants and has devised a system of nursing care for these infants which has been eminently successful in reducing the premature death rate in the City of Chicago. When this nurse has completed her special training, she will return to Minnesota and embark at once upon an itinerary, planned for her by the coöperating agencies, which will include most of the Hospitals in the State.

Minnesota has always ranked with the leading two or three states in its infant and maternal mortality rates. Since so large a percentage of even the extremely low rate which now exists is due to prematurity, the agencies involved are extremely hopeful that the successful operation of this project will markedly reduce the present infant mortality rate in Minnesota.

Keeping Abreast in Medicine

Dr. W. A. O'Brien, medical director Center for Continuation Study, University of Minnesota: Since January, 1937, the Center for Continuation Study at the University of Minnesota has conducted 23 courses in post-graduate medical education and six courses in post-graduate hospital education. In the medical field, the average enrollment has been 26 for each course and the average faculty appointments have been 24. In the hospital fields, average enrollment has been 66; average faculty appointments 26. To date, there have been more than 1,000 enrollments in the above courses. This is approximately 25 per cent of the total enrollment for all courses offered at the Center. The main fields are medicine and hospitals, education, social welfare, and professionalized community service. There have been courses in practically every field, including welding for engineers, visual education for teachers, pharmacy for pharmacists, and so forth.

Approximately half of the physicians who attend courses at the Center are from Minnesota. The others are from Wisconsin, North Dakota, South Dakota, Montana, Wyoming, Nebraska, Iowa, Manitoba, Saskatchewan, Illinois, Florida, California, and other states. Approximately half of the physicians have graduated from the University of Minnesota. The median age is 42. In the hospital field, more states are represented. In the course for Hospital Administrators, 91 administrators represented 73 institutions in 52 cities, having a total bed capacity of 10,356 and 994 bassinets. The 87 medical record librarians came from 47 cities in 16 states and represented 71 hospitals with 14,250 beds and 1,684 bassinets.

The average medical course is six days in length; hospital courses are either three or six days. All the courses deal with specialized subjects. In medicine, there are 42 possible specialized courses and there are 38 in the hospital field. It is felt that more information can be obtained by developing a fairly narrow field than by trying to cover too much ground. Much more can be accomplished by helping the hospitals as well as the physicians. In this way, new technics can be more quickly put into effect.

Advantage Obvious

The University of Minnesota now has undergraduate, graduate, and post-graduate departments. In the Medical School proper there are 589 students; Nursing Education—390; Post-graduate Nursing Education—26; Medical Technology—240; Public Health—140; Dietetics—12; Medical Social Service—12; and pharmacy students in the hospital — 40. In the Graduate School, main campus and Mayo Foundation, there are 530 registered in Medical Sciences. The advantage of going to the University for short intensive post-graduate courses is obvious. The physician is able to accomplish a great deal in a short time because he is given a special program in a place reserved just for him. When more physicians in Minnesota take advantage of the opportunities which are now provided, there will be less criticism of the profession for failing to keep abreast of the new advances in medicine.

Industrial Hygiene

Dr. R. N. Barr, State Department of Health: A bill for an act to "provide for the investigation and control of poisoning and disease contracted as a result of the nature of employment and for reporting of such cases of poisoning and disease" has been introduced into the legislature under sponsorship of the State Department of Health and referred to the Public Health and Hospital Committee. It should be noted that the bill not only provides for the reporting of occupational diseases but also provides that the department shall make investigations and recommendations for the elimination and prevention of occupational diseases. Most important of all, it provides that information secured through investigations made in accordance with the provisions of this bill shall not be admissible as evidence in any action of law to recover damages for injury or in actions under the Workmen's Compensation Act. This would mean, simply, that the work of the Department would not be involved in civil suits. It would not in any way limit the authority of the Industrial Commission or any other state agency in enforcing rules and regulations necessary to protect the health of employees. If the bill is passed, it will become possible for the State Board of Health to give organizations and industries a technical service which they are unable to secure at the present time, because they have neither trained personnel nor laboratory equipment with which to carry out such work.

Anticipating the possibilities of this work, the State Board of Health has included in its budget request for the biennium 1939-41 an appropriation of $12,000 per annum to provide for personnel and laboratory expense.

Monthly Program

Dr. J. B. Carey, Minneapolis, chairman of the Committee on Hospitals and Medical Education: The Coördinated Medical and Public Health Program of 1939 of the Minnesota State Medical Association introduces no new activities into our state medical association program. It provides, merely, that all of our public health education work be so organized that all of us are thinking and talking about the same things at the same time. A subject of timely interest has been selected for each month and, during that month, our newspaper, radio, and speakers' bureau service is all directed toward education on various phases of that subject. In addition, a packet of new material designed to aid the doctor in talking privately or publicly on the subject is sent by the State Office on request to any member of the association.

Packet Popular

The program seems to be popular with our members as well as with the public. More than 723 requests have been received at the State Office for the packet. A large number of talks have been booked and many other agencies such as the Federation of Women's Clubs, the Congress of Parents and Teachers and others, have welcomed it and incorporated it into their own health programs. Our thanks are due to the State Department of Health for the splendid co-operation of every division in supplying material and advice for monthly packets.

THE DOCTOR TAKES THE AIR

County officers listened with great interest to the symposium on forming public opinion which was one of the highlights of the 1939 County Officers' Conference at the St. Paul Hotel, Saturday, February 25.

New radio stations are opening up all over the state and most of them are willing and anxious to arrange for medical broadcasts. Requests for public talks on health and on medical problems are also frequent and insistent in many parts of the state. Every physician knows he will be called upon, sooner or later, to make a speech and he is wise to prepare himself.

For Platform Talks

The following hints for the platform speaker were given in an excellent talk by Dr. Howard Gilkinson, University of Minnesota Speech Department.

1. Plan for clearness. Talk about one thing at a time and make clear transitions from one topic to another.

2. If possible, use visual aids. Visual aids and oral discussion are more effective together than either one alone. The order should be, first, introductory remarks; second, picture or slide; third, discussion.

Vary Your Voice

3. Never be a vocal dead pan. Vary your pitch and the quality and intensity of your voice.

4. For emphasis, pause before and after an important statement. If necessary, repeat it once or twice. Four or five repetitions, however, are outlawed. Remember that statements made at the beginning of a speech are best remembered. The next best position is the end of the speech.

5. Draw upon some or all of the following sources of belief: One, a logical train of thought which draws the audience with you to a logical conclusion; two, if possible, identify your statements with established, axiomatic principles; three, draw heavily upon personal experience; four, if possible, cite persons of expert knowledge on the matter in hand; five, draw upon public opinion itself, since the opinion of a group brings considerable authority; six, draw upon the audience's desire for satisfaction and advantage.

At the "Mike"

For the potential radio speaker and radio program, Mr. Max Karl, education director of WCCO, gave the following suggestions:

1. Physicians who plan radio campaigns should stick to talks and avoid the extravaganza type of program.

2. There is obvious limitation of time so far as the broadcaster is concerned. The schedule is divided into 15-minute periods, and the hours between six and ten in the evening are sold. Ask for 15 minutes time and be prepared to fill it.

3. Try out your voice first to see if it will broadcast well. If not, find someone else to make your talk whose voice is better. Let the broadcaster, who knows what carries best over the air, decide whether or not your voice is good—don't believe the comments of friends. Some people sound alive on the air and most people don't. In many cases, however, the broadcaster may be able to help you project your personality on the microphone.

Talk to Two or Three

4. Your audience is vaster than you could ever hope to have in a public hall; nevertheless, you must address yourself to two or three people as if you were having an intimate living room conversation.

5. Dr. W. A. O'Brien's formula for a radio talk is good. He answers the following questions: first, what is it or what is the cause? Second, how does it affect you? Third, what do you do about it?

A sheet of excellent suggestions on the preparation of radio talks was passed to the county officers by Mr. Karl and a copy is available upon request at the State Office.

"WE MUST TELL THE AMERICAN PEOPLE"—Dr. Leland

Dr. R. G. Leland, director of the American Medical Association's Bureau of Medical Economics, was a guest speaker at the conference. As an official representative of the American Medical Association and as an acknowledged authority on all questions relating to the distribution of medical care in the United States, Dr. Leland's remarks are important. They are reproduced in part here:

The new national health program and its sponsors have implied that delivery of medical care is helter-skelter in the United States, that the American Medical Association has had no health program, that its members have not looked after the health of the people. Members of the American Medical Association have been held up to ridicule and much has been done to shake the confidence of the people in their physicians.

Atmosphere Surcharged

We enter upon discussion of the program in an atmosphere surcharged with tension and confusion of terms. New and sly meanings have been devised for old terms.

To the physicians, the term "Socialized Medicine" is an inclusive term, covering insurance medicine, coöperative medicine, and state medicine. Actually, socialized medicine has nothing to do with the treatment of the patient. It is concerned with a variety of methods of distribution of medical care, all of which are financed by groups rather than independent individuals.

Terms Confused

"State Medicine" refers solely to medicine that is provided directly by the state. The only example of state medicine in existence is Russia and, even there, state medicine is not complete.

"Public Medicine" refers solely to the medical care provided by the government for special groups such as the insane and the tuberculous for the protection of the entire population. This type of medicine has been actively supported by the organized medical profession since the first meeting of the American Medical Association in 1847.

"Sickness insurance" refers solely to the prepayment method of financing medical care for sickness. In a compulsory form, this type of financing has been carried on extensively in other countries. We are justified in examining it carefully when any proposal is made for establishing it in our own country since a study of comparative death rates shows definitely that something is lacking in those countries that is present here.

The "Medical Group" means, to physicians, an association of several physicians for the purpose of using facilities in common. The term "Group Medicine" is often used to mean compulsory pre-payment medicine in current discussions on the subject.

The term "Coöperative Medicine" is likewise used to mean voluntary sickness insurance or contract medicine. Actually, coöperatives start at buying wholesale and selling to members at retail. Medicine cannot be bought at retail and it is obvious that people who talk about cooperative medicine are using the term incorrectly.

Answer Is "No"

The President submitted the national health program to Congress with only one recommendation—that the Congress study it carefully (editor's note: the Wagner bill, introduced since Dr. Leland's visit to St. Paul, is analyzed in the March 11 issue of the *Journal of the American Medical Association*).

We are told, by backers of the program and many others, that 40 million Americans are not receiving medical care.

Are one-third of the people in your community deprived of care? The answer of any physician would be "No." We are told that 20,000,000 people are receiving an annual income of less than $800; that 42½ per cent of them are now on some form of government relief.

If the government has assumed responsibility for the necessities of life for these people, why is it that they, at least, are not getting adequate medical care?

Furthermore, 7 per cent of these people are receiving aid under the Social Security Act. Why was it not thought necessary to include a provision for medical care in the amount allowed under this act?

Need Recognized

Another 42 per cent are in the marginal class. The medical profession recognizes fully the need for assistance for this class. But we believe that aid to these people is a community responsibility and should be financed by local taxation.

We believe in expanding public health measures. We do NOT believe that public health departments should be forced into the private practice of medicine.

We believe, also, in the expansion of hospital facilities. But we find many hospitals, now, with vacant beds and it seems to us senseless to spend more money to duplicate existing hospitals. Instead, government money should be used where it is needed to save the private hospitals. New hospitals should be built only in communities where the need can be fully demonstrated.

Medicine is not opposed in principle to any part of the program except to the recommendation for compulsory sickness insurance. If an opportunity arises to present our position to the House Ways and Means Committee I am sure representatives of state associations will be allowed to appear if they choose. In the meantime, it is essential that we tell the American people our position.

Medicine's Program

We have always had a program for the improvement of medicine and medical care. We have elevated the standards of education and of hospitals. We have developed boards in the specialties, all directed toward providing better qualified physicians. We are as irked by slowness of advances in the distribution of services as anybody.

The thing that distresses medicine, now, is how to effect a more even distribution. We are working on the problem. County medical societies should make and operate a variety of plans with the approval of their state associations. Ours is not a policy of objection or obstruction, and we have no need to be ashamed. We recognize that there are places where it is difficult to carry medical and hospital care, where the population is less than one person per square mile and where special measures must be instituted to provide for the people.

We are not opposed, certainly, to any plan that will provide good medical care for all the people at prices the people can afford to pay. But quality is more important, by far, than quantity in the distribution of medical service. We are definitely opposed to any plan whatsoever that will lower the quality of medical care given the American people.

DO YOU HELP OR HINDER?

(Monthly Editorial Prepared by the Medical Advisory Committee)

For several years, your Medical Advisory Committee has been preaching the power of toleration and judgment in the attitude of one medical man toward another; that the Golden Rule is as applicable today as it was in the past, and that, if each of our members would attempt to place himself in the other man's place, so-called malpractice litigation would cease or at least be confined to a very small number of cases.

A careful perusal of the number of cases being brought against us at this time shows that the membership of the society is becoming of one mind. Maybe the danger of Socialized Medicine has had its influence. Each one of us knows that if Socialized Medicine or one of its ramifications is not to be foisted onto the medical profession and the sacred, confidential patient-doctor relationship is not to be lost, we must take a most tolerant attitude toward one another. There must be no split in our ranks, our thoughts must be the same, our work must be bettered, our associations with each other must be more friendly, and a general feeling of helpfulness and interdependence engendered in our ranks.

Most of the cases brought during the last year against our members have had no merit and were attempts to obtain money from an easy source to pay the past due obligations of the plaintiff. A small percentage had some merit and were or could be easily settled to the advantage of all parties concerned.

Published papers show that there is very little difference in the type of medical work in various parts of the state, rural or urban, and that the people in all parts of Minnesota are particularly fortunate in the high type of professional men with whom they have to deal.

Further, inter-professional meetings such as the one recently held in Saint Paul should build up a most wholesome feeling between the men practicing dentistry, medicine, and law. They argue well for the future of the professions and their better mutual understanding. Attendance at a meeting of this type may answer for you the question, "Do you help or hinder?"—B.J.B.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Report of Licensure Under Date of February 11, 1939

By Examination

Anderson, Hubert Louis, Saint Paul, Minnesota. University of Minnesota, Bachelor of Medicine, June 13, 1938.

Bickel, William Harold, Rochester, Minnesota. Northwestern University, Doctor of Medicine, March 18, 1936.

Bigler, Ivan Edward, Duluth, Minnesota. University of Minnesota, Bachelor of Medicine, June 13, 1938.

Dorton, Howard Ellsworth, Rochester, Minnesota. University of Illinois, Doctor of Medicine, July 1, 1937.

Eck, Raymond Livingston, Livingston, Montana. University of Minnesota, Doctor of Medicine, March 17, 1938.

Eisenstadt, William Sawyer, St. Paul, Minnesota. University of Minnesota, Bachelor of Medicine, March 17, 1938.

English, John Paul, Rochester, Minnesota. University of Pennsylvania, Doctor of Medicine, June 19, 1935.

Fiel, Charles Augustus, Jr., Rochester, Minnesota. Indiana University, Doctor of Medicine, June 15, 1936.

Fleming, Dean Stephen, Minneapolis, Minnesota. University of Minnesota, Doctor of Medicine, March 18, 1937.

Guthrie, Robert Fulmer, Rochester, Minnesota, Emory University, Doctor of Medicine, June 11, 1934.

Harley, Robison Dooling, Rochester, Minnesota. University of Pennsylvania, Doctor of Medicine, June 10, 1936.

Harper, Samuel Bowman, Rochester, Minnesota. University of Wisconsin, Doctor of Medicine, June 21, 1937.

Hedemark, Norman George, St. Paul, Minnesota. University of Minnesota, Bachelor of Medicine, June 13, 1938.

Hursh, Marion Douglas, Lake City, Minnesota. University of Minnesota, Doctor of Medicine, June 13, 1938.

Idstrom, Linneus G., Minneapolis, Minnesota. University of Minnesota, Bachelor of Medicine, June 13, 1938.

Johnson, Allen Gray, Duluth, Minnesota. University of Minnesota, Bachelor of Medicine, June 13, 1938.

Johnson, Karl Eugene, Pine River, Minnesota. University of Minnesota, Doctor of Medicine, June 13, 1938.

Kamish, Robert James, Minneapolis, Minnesota. University of Minnesota, Doctor of Medicine, June 13, 1938.

Keithahn, Elmer Edward, St. Paul, Minnesota. University of Minnesota, Bachelor of Medicine, June 13, 1938.

Little, Alexander Graham, Jr., Rochester, Minnesota. Johns Hopkins University, Doctor of Medicine, June 7, 1937.

Loken, Selmer Milo, Saint Paul, Minnesota. Rush Medical College, Doctor of Medicine, June 10, 1938.

Magnuson, Allen Einer, Saint Paul, Minnesota. University of Minnesota, Bachelor of Medicine, June 13, 1938.

McCallig, John J., Rochester, Minnesota. University of Oregon, Doctor of Medicine, May 31, 1937.

McHeffey, George Jerome, Rochester, Minnesota. University of Michigan, Doctor of Medicine, June 23, 1930.

Nachtigall, Henry Blum, Ely, Minnesota. University of Minnesota, Bachelor of Medicine, June 13, 1938.

Patton, William Burgamy, Rochester, Minnesota. Johns Hopkins University, Doctor of Medicine, June 11, 1935.

Pedersen, Roy Clarence, Duluth, Minnesota, University of Minnesota, Bachelor of Medicine, March 13, 1938.

Prunty, Francis Crandall, Rochester, Minnesota. Jefferson, Doctor of Medicine, June 5, 1931.

Rasmussen, Waldemar Curtis, Rochester, Minnesota. University of Minnesota, Doctor of Medicine, June 15, 1936.

Robinson, Francis Joseph, Rochester, Minnesota. Northwestern University, Doctor of Medicine, June 13, 1936.

Scheifley, Charles Holland, Rochester, Minnesota. University of Minnesota, Bachelor of Medicine, June 14, 1937.

Sealy, William Burgess, Rochester, Minnesota. University of Texas, Doctor of Medicine, May 31, 1934.

Strem, Edward Louis, St. Paul, Minnesota. University of Minnesota, Bachelor of Medicine, June 13, 1938.

Svien, Hendrik J., Rochester, Minnesota. University of Minnesota, Doctor of Medicine, June 13, 1938.

Weaver, Paul Henry, Minneapolis, Minnesota. Ohio State University, Doctor of Medicine, June 13, 1938.

Williams, John Arthur, St. Paul, Minnesota. University of Minnesota, Bachelor of Medicine, June 13, 1938.

Wilson, Ira Herman, Rochester, Minnesota. University of Minnesota, Doctor of Medicine, December 19, 1935.

Woods, Robert Max, Rochester, Minnesota. Marquette University, Doctor of Medicine, June 15, 1938.

Yugend, Sidney Frederick, St. Paul, Minnesota. University of Minnesota, Doctor of Medicine, June 13, 1938.

By Reciprocity

Fishback, Charles Franklin, Minneapolis, Minnesota. Northwestern University, Doctor of Medicine, June 3, 1933.

Fleming, Ralph Gibson, Rochester, Minnesota. University of Pennsylvania, Doctor of Medicine, June 10, 1936.

Hyslop, Leland Francis, Wisconsin. Northwestern University, Doctor of Medicine, June 15, 1925.

Meriwether, Lodwick Sterritt, Rochester, Minnesota. University of Virginia, Doctor of Medicine, June 16, 1931.

Polan, Charles Gabriel, Minneapolis, Minnesota. Rush Medical College, Doctor of Medicine, June 16, 1936.

Rein, Walter John, Minneapolis, Minnesota. University of Wisconsin, Doctor of Medicine, June 24, 1935.

National Board

Lowry, Elizabeth C., Minneapolis, Minnesota. Cornell University, Doctor of Medicine, June 6, 1935.

Lowry, Thomas, Minneapolis, Minnesota. Cornell University, Doctor of Medicine, June 6, 1935.

Phillips, Richard Betts, Rochester, Minnesota. University of Edinburgh, Doctor of Medicine, December 15, 1933.

Wilson, William Hildebrand, Rochester, Minnesota. Northwestern University, Doctor of Medicine, June 11, 1938.

Minneapolis Physician Convicted of Manslaughter

Re: State of Minnesota vs. George F. Lemke.

On February 25, 1939, a jury in the District Court of Hennepin County returned a verdict of guilty against Dr. George F. Lemke, who formerly maintained offices at 512 Pence Building, Minneapolis. Dr. Lemke was charged with manslaughter in the first degree following the death, on December 10, 1938, of a 22-year-old Saint Paul girl. The indictment against Dr. Lemke charged him with the death of the girl following a criminal abortion.

On March 3, 1939, Judge W. W. Bardwell sentenced Dr. Lemke to a term of five to tweny years in prison in connection with this case. Dr. Lemke's lawyer announced that an appeal would be taken and the Court granted a stay of thirty days in which to perfect the appeal. Dr. Lemke's license, as a physician and surgeon, was revoked by the Minnesota State Board of Medical Examiners on February 11, 1939, following a hearing held before the Medical Board as the result of the death of this girl.

The case was well handled for the State of Minnesota by W. G. Compton, Peter S. Neilson and Howard T. Van Lear, Assistant County Attorneys.

In Memoriam

Andrew S. Backus
1881-1939

DR. ANDREW STEPHEN BACKUS died at St. Paul, January 20, 1939, at the age of fifty-seven.

Dr. Backus was born September 22, 1881, at Tyrconnel, Ontario, Canada, of Scotch and Irish lineage. His ancestors settled in that vicinity in 1809 on land purchased from Colonel Talbot, which is still occupied by some of their descendants.

He entered the medical college of Toronto University at the same time as an older and younger brother, and was graduated in 1905. Receiving the degrees of M.D., C.M., and F.T.M.C. upon graduation, he divided a year's internship between St. Michael's Hospital, Toronto, and Riverside Hospital at Buffalo, New York. He then went to San Francisco, California, and was ship surgeon on the S. S. San Jose, going to Panama, returning after the San Francisco earthquake.

Dr. Backus then went back to Toronto, Canada, and was married on November 14, 1906, to C. V. Maude Brown. Following his marriage, he went to North Dakota to practice and remained there until November 14, 1923, when he moved to Saint Paul, where he continued to practice until his death.

Dr. Backus was a member of Ramsey County Medical Society, and the Minnesota State Medical Association, and a staff member of Miday Hospital.

He was surgeon for the American Radiator Company from the opening until the closing of the Saint Paul plant in 1930. For several years, he was Deputy Coroner for the city of Saint Paul. He belonged to Hamline Methodist Church where he had served upon the finance board.

Dr. Backus was one of the organizers of the Como Golf Club, served as one of its officers, and was honorary vice president at his death. He was a member of the National Congress of Parents and Teachers.

He was also a member in good standing of the following fraternal organizations: Midway Lodge No. 185, A.F. and A.M., Minnesota Chapter No. 1, Royal Arch Masons, Minnesota Consistory, a member of Osman Temple Shrine, and Hamline Chapter No. 228, O.E.S. He had served for five years as trustee of B.P.O. Elks Lodge No. 59. He was also Trustee of Loyal Order of Moose No. 40 for six years.

In his obstetric practice, he never lost a mother though for seventeen years these cases were taken care of in North Dakota farm homes.

Dr. Backus was a friend, as well as a physician to his patients. He was honorable in his profession, kind, courteous, and sincere to everyone. He will truly be missed.

He is survived by his wife, and one brother, John Edward, of Ontario, Canada.

OF GENERAL INTEREST

On the evening of March 1, Dr. Irvine McQuarrie, Professor and Head of the Department of Pediatrics of the University of Minnesota Medical School, lectured before the Montreal Neurological Society at McGill University, Canada. The subject of his discourse was "Physico-chemical Studies on the Mechanism of Convulsive Phenomena."

* * *

Dr. E. O. Enroth, associate of Dr. E. R. Sterner, White Bear, Minnesota, for the past year and one-half, has taken over the entire practice in this community. Dr. Sterner, who has been dividing his time between his Saint Paul and White Bear offices, will now give full time to his Saint Paul practice.

* * *

On March 15, Dr. Richard F. Herbst, formerly of Minneapolis, assumed the practice at Hawley, Minnesota, of the late Dr. Martin C. Bergheim. Assisting Dr. Herbst is Mrs. Herbst, a graduate nurse of Saint Mary's Hospital, Minneapolis.

* * *

With Dr. E. F. McElmeel, of Pipestone, speaking on pneumonia and common colds, the women's organizations of Ihlen, Minnesota, on February 23, initiated the first in a planned series of medical discussions. Future discussions will bring to Ihlen other physicians from the surrounding districts.

* * *

Dr. P. S. Hench, of Rochester, Minnesota, addressed the New York Academy of Medicine on March 2, and the Southern California Medical Association on March 15. Mrs. Hench, with the children, and her mother, Mrs. J. H. Kahler, left about March 1, for California, where Dr. Hench joined them after returning from his speaking engagement in the East.

* * *

Dr. John P. Darling, Rochester, who was seriously injured in an automobile accident in January, is now in Florida, completing his convalescence.

* * *

Shortly after the first of March, Dr. and Mrs. L. F. Wasson moved to Osakis, Minnesota, where Dr. Wasson joined Dr. E. Haberman in the practice of medicine. Dr. Wasson formerly practiced in Chisago City.

* * *

At the meeting of the medical history society, Cos Cnidos, held in the Minneapolis Club, March 15, 1939, Dr. Arthur E. Hertzler, of Halstead, Kansas, gave reminiscences of his early days in the practice of medicine and presented some of his ideas regarding thyroid disease. Dr. S. Marx White was elected president of the society to succeed Dr. John Armstrong. Miss Jean E. Hirsch was reëlected secretary-treasurer.

Dr. G. B. Eusterman and Dr. W. C. Alvarez, of Rochester, have been honored by being elected corresponding members of the Societé de Gastro-enterologie de Paris. The society met December 12, 1938.

* * *

President of the Todd County Medical Association, Dr. W. W. Will, of Bertha, Minnesota, presided at a dinner meeting of the organization on February 23. The program of the evening included a discussion of fractures of the hip, by Dr. A. W. Ide, chief surgeon of the N. P. B. A. Hospital, Saint Paul, and a paper on cancer of the large intestine, by Dr. W. J. Lund of Staples.

* * *

Dr. Howard Burchell, a fellow of the Mayo Foundation, left March 7 for London, where he will study for five months. Dr. Burchell was guest of honor at a dinner given by Dr. George Pollock, of Rochester, Minnesota, on the Saturday evening preceding the latter's departure.

* * *

At the annual meeting and post graduate course of the Alumni Association of the University of Oregon Medical School, held the first Monday and Tuesday of March, Dr. G. B. Eusterman, of Rochester, delivered three lectures and conducted a roundtable discussion. On Monday, March 13, he addressed the Columbia Medical Society of Columbia, South Carolina.

* * *

Dr. Paul Rick, who has been physician and surgeon in the community of Le Center, Minnesota, for the past two years, recently opened offices in Saint Paul at 966 Arcade Street.

* * *

Dr. W. R. Lovelace, Fellow in surgery of the Mayo Foundation, will go to Europe in April for two months' study, as a result of his having received the J. William White Scholarship. Contributory to his receiving this award was his part in developing an oxygen mask for the comfort of aviators flying at high altitudes. He collaborated in this work with Dr. W. M. Boothby and Dr. H. A. Bulbulian.

* * *

The Annual Harold S. Boquist Lecture at the University of Minnesota Medical School will be given by Dr. Henry C. Sweany, Medical Director of Research, Chicago Tuberculosis Sanatorium, on Tuesday, April 4, 1939. Dr. Sweany's subject will be "The Study of the Pathogenesis of Tuberculosis by Correlating Age and Morphology of Primary Tubercles."

* * *

The Eastern Clinic of Fergus Falls has recently moved into its new commodious clinic building at 106 South Union Avenue. The Clinic's personnel consists of Dr. C. O. Estrem, Dr. E. A. Heiberg, Dr. G. J. Mouritsen, and Dr. C. J. Lund.

REPORTS and ANNOUNCEMENTS

MEDICAL BROADCAST FOR APRIL

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 11:00 o'clock every Saturday morning over Station WCCO, Minneapolis (810 kilocycles or 370.2 meters) and Station WLB, University of Minnesota (760 kilocycles or 395 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota. The program for the month will be as follows:

April 1—Cause of Cancer
April 8—Cancer in Women
April 15—Cancer in Men
April 22—Early Diagnosis of Tuberculosis
April 29—Cancer of the Head and Neck

AMERICAN BOARD OF INTERNAL MEDICINE, INC.

Written examinations for certification by the American Board of Internal Medicine will be held in various sections of the United States on the third Monday in October and the third Monday in February.

Formal application must be received by the Secretary before August 20, 1939, for the October 16, 1939, examination, and on or before January 1 for the February 19, 1940, examination.

Application forms may be obtained from Dr. William S. Middleton, Secretary-Treasurer, 1301 University Avenue, Madison, Wisconsin, U. S. A.

POSTGRADUATE COURSE FOR PHYSICIANS IN OBSTETRICS AND PEDIATRICS

Beginning Wednesday, April 26, and continuing for five consecutive Wednesdays, the third annual series of the Postgraduate Course for Physicians in Obstetrics and Pediatrics will be presented in ten centers of the state. This course is sponsored jointly by the Minnesota State Medical Association, the Medical School of the State University, and the Minnesota Department of Health. It is financed by Maternal and Child Health funds coming to the Minnesota Department of Health under the provisions of the Social Security Act. The dates and places for the meetings are as follows:

April 26—Pine City
Winona
May 3—Fergus Falls
Little Falls
May 10—Willmar
Virginia
May 17—Worthington
Grand Rapids
May 24—Albert Lea
Crookston

The meetings will be conducted in the same manner as last year, which proved so acceptable to the practicing physicians. There will be one full day meeting in each center, beginning promptly at 8 o'clock in the morning, and composed of eight lecture and discussion periods—four each on obstetrics and pediatrics. Further information covering the details of arrangements will be mailed to the physicians in the near future.

STATE MEETING

The introduction of two series of Round Table luncheons constitutes one of the most interesting innovations scheduled for the Minnesota State Medical Association's 86th Annual Meeting to be held at the Minneapolis Auditorium, May 31, June 1 and 2.

Similar luncheon meetings are an established and very popular feature of the meetings of the State Medical Society of Wisconsin. If they are well received in Minneapolis, they may become a regular part of future meetings in Minnesota.

There will be ten of these luncheons on Wednesday, May 31, and ten on Thursday, each on a different subject, with leaders picked from the visiting speakers and from Minnesota leaders among the specialties. Only 20 tickets will be sold for each luncheon so that discussion groups may be kept small. No formal programs will be arranged.

The list of subjects will be sent to each member. Those who wish to attend will be required to buy their tickets in advance and send in first, second, and third choices in case registrations should be filled. The luncheons will be held in the Curtis Hotel, which has been selected as hotel headquarters for the meeting.

A distinguished scientific program has been arranged for the first two days of the meeting, with Dr. Andrew C. Ivy of Northwestern University, Dr. Thomas Francis, Jr., of New York University, and Dr. W. Edward Chamberlain of Temple University among the guest speakers.

A fracture demonstration hour conducted by Dr. O. W. Yoerg of Minneapolis, Dr. Victor Hauser of St. Paul and Dr. Henry Meyerding of Rochester is an unusual feature of the first morning's program. An extensive fracture exhibit under auspices of the Committee on Fractures rounds out an unusual program section on fractures.

Among other demonstrations of immediate especial current interest will be three from the Department of Surgery of the University of Minnesota, including a demonstration on blood transfusion, on the treatment of surgical shock and also the treatment of intestinal obstruction and the uses of nasal suction. Dr. W. R. Lovelace and his associates, of Rochester, will be there, also, to demonstrate their oxygen masks for high altitude flying. Demonstrations, exhibits and a carefully selected group of motion pictures will occupy two 45-minute program recesses each day.

The annual banquet is scheduled for Thursday night, June 1, at the Curtis, with Governor Harold E. Stassen as principal speaker.

The Friday program will be devoted exclusively to a Conference on Medical Problems in which dentists, pharmacists, nurses, social welfare workers and hospital administrators will be invited to participate. Among the speakers already scheduled for this conference are Dr. F. W. Jackson, Winnipeg, Deputy Minister of Health of Manitoba; Mr. J. G. Crownhart of Madison, secretary of the State Medical Society of Wisconsin; Attorney General J. A. A. Burnquist and Senator Henrik Shipstead. Final announcement of speakers and program for this session will await legislative developments in Washington so that its subject matter may be pertinent to the current situation.

Five thousand physicians from Minnesota, Wisconsin, Iowa, the Dakotas, Montana and the nearer provinces of Canada will be invited to the scientific sessions. They will be joined by members of allied professions from all over the state for the Friday meeting.

MINNEAPOLIS SURGICAL SOCIETY

At the regular monthly meeting of the Minneapolis Surgical Society, held in the Minneapolis Athletic Club on the evening of Thursday, March 2, Dr. Willard B. White was elected president for the ensuing year, Dr. L. Haynes Fowler, vice president and Dr. H. M. Lee, member of the executive council. Dr. Harvey Nelson carries over as secretary-treasurer, having been reëlected for three years, last year. Dr. George R. Dunn, president, was president last year.

WASHINGTON COUNTY

Members of the Washington County Medical Society, at their meeting March 14, heard Dr. H. E. Richardson, of Saint Paul, discuss, at length, "Some Heart Conditions." His talks proved very instructive. He carefully explained newer methods of diagnosis, especially emphasizing electrocardiography as a great help in obscure heart conditions, whereby earlier recognition of these are possible, and better end-results in treatment may be obtained. He advocated complete rest, and the judicious and careful use of drugs as indicated.

WINONA AND WABASHA COUNTY JOINT MEETING

The eighth annual joint meeting of the Winona and Wabasha County Medical Societies, and the fourteenth annual dinner tendered by the Buena Vista Sanatorium Commission to the physicians of the counties, was held at the Sanatorium, Wabasha, Monday evening, March 13. There were thirty-two in attendance. The program was arranged by Dr. Russell H. Frost, superintendent of the Sanatorium, with Dr. R. L. Page of St. Charles, president of the Winona County Society, acting as toastmaster.

Speakers and subjects were as follows:

Dr. George A. Earl, St. Paul, president of the Minnesota State Medical Association—"Carcinoma of the Gastro-intestinal Tract."

Dr. Edward T. Evans, Minneapolis—"Common Orthopædic Conditions of the Foot, Knee, and Hip."

Dr. Lewis I. Younger, Winona, read on its fiftieth anniversary, a paper on "The Contagiousness of Tuberculosis," originally presented in 1889 by the late Dr. Donald B. Pritchard of Winona. Discussion by Dr. Russell H. Frost, superintendent of the Buena Vista Sanatorium.

Dr. Benjamin B. Souster, St. Paul, showed a movie illustrating the "Mechanism of the Heart Beat and Electrocardiography."

In addition, Dr. Earl, president; Mr. R. R. Rosell, executive secretary, and Dr. Souster, secretary, discussed the problems of the Minnesota State Medical Association and present-day trends in medical practice.

AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS

The 24th annual meeting of the American Association of Industrial Physicians and Surgeons with the American Conference on Occupational Diseases and Industrial Hygiene will be held at the Hotel Statler, Cleveland, Ohio, June 5, 6, 7 and 8, 1939. A program of timely interest and importance will be presented by speakers of outstanding experience in all of the medical and engineering problems involved in industrial health. A cordial invitation is extended to all whose interests bring them in contact with these problems. Information regarding hotel accommodations, etc., may be obtained from A. G. Park, Convention Manager, 540 North Michigan Avenue, Chicago.

AMERICAN ASSOCIATION ON MENTAL DEFECT

The 63rd annual convention of the American Association on Mental Defect will be held at the Palmer House in Chicago, Illinois, from May 3 to 6, inclusive.

Dr. C. Stanley Raymond, Wrentham State School, Wrentham, Massachusetts, is chairman of the Public Relations Committee.

SCOTT-CARVER SOCIETY

On March 14, 1939, the Scott-Carver Medical Society met at Mudcura Sanitarium. Dr. Edgar Bedford, Minneapolis, spoke on "The Clinical Aspects of Gallbladder Disease." Dr. Ames Naslund spoke on "X-ray Diagnosis in Gallbladder Pathology."

The Society was also recently addressed by Dr. Carl Rice, Minneapolis, who spoke on "Indications for Surgery of the Thyroid Gland"; and Dr. Chauncey Borman, Minneapolis, who spoke on X-ray Measurements of the Female Pelvis."

WOMEN'S AUXILIARY

MRS. W. B. ROBERTS, Minneapolis, *President*
MRS. E. V. GOLTZ, 2259 Summit Avenue, Saint Paul, *Publicity Chairman*

Hennepin County

Members of the Woman's Auxiliary of the Hennepin County Medical Society held their March meeting Friday, March 10, in the lounge in the Medical Arts Building, Minneapolis. The meeting was postponed from Friday, March 3, due to the elevator strike. After the regular business meeting the group heard Dr. Brown of the Child Guidance Clinic of the Minneapolis Public Schools speak on "Mental Health" which was a most interesting discussion. Tea followed with a social hour. Mrs. W. B. Roberts and Mrs. C. E. Willcutt poured. Mrs. L. R. Boies was the social chairman.

Hennepin County members are busy planning their annual card party which is held each year on Easter Monday, the proceeds being used for philanthropic work. This year there will be nine different parties at various homes with one party in the main lounge in the Medical Arts building. These parties will be in various districts of the city, and the following members will be hostesses: Mmes. O. J. Campbell, L. O. Doyle, R. M. Ericson, J. C. Hultkrans, R. T. Knight, C. M. Larson, F. B. Mach, Carl O. Rice and C. W. Waldron. Mrs. C. E. Willcutt is the general chairman and Mrs. H. B. Hannah is co-chairman.

Plans are nearly completed, now, for the annual convention to be held in Minneapolis in May and the Hennepin County members are looking forward to a large registration. Mrs. J. S. Reynolds will be the chairman for this event.

Several members of the State Auxiliary were recent guests at a meeting held in the Woman's Club, Minneapolis, when women from various parts of the state who are serving on the Minnesota Committee on Woman's Participation in the New York World's Fair were guests of Mrs. John Dalrymple. Those attending the luncheon included Mrs. J. A. Thabes of Brainerd and Mrs. A. A. Passer of Olivia.

A baby son was born, February 25, to Dr. and Mrs. Leo Fink of Minneapolis. Mrs. Fink is the publicity chairman for the Hennepin County Auxiliary.

A number of Hennepin County members have enjoyed vacations in the south this winter, including Dr. and Mrs. R. R. Cranmer, Dr. and Mrs. Martin Nordland, Dr. and Mrs. J. C. Davis, Dr. and Mrs. J. S. Reynolds, and Dr. and Mrs. J. H. Simons.

* * *

West Central

Our State President, Mrs. W. B. Roberts, attended the March meeting of the West Central group which was held March 8 in Morris, Minn., with the president, Mrs. I. L. Oliver of Graceville, presiding. It was a joint meeting with a dinner at the hotel after which members of the Auxiliary held their business meeting. Mrs. Roberts was the house guest of Mrs. Charles Bolsta of Ortonville who is a member of the State Advisory committee.

* * *

Washington County

March 14, members of the Washington County Auxiliary held a meeting at the home of Mrs. R. J. Josewski in Stillwater. Nine members were present and Mrs. W. B. Roberts motored to Stillwater for the event. During the meeting, Mrs. Josewski received a package from the Hygeia department of the American Medical Association, containing a statute, a gift in appreciation of her services in the Hygeia campaign. Minnesota can be proud of the results of this contest for Washington County won sixth place and Park Region fifth place in the entire United States, which gives Minnesota two places out of the ten.

After the business meeting, Mrs. Josewski served a delicious supper.

Recent Developments in the Treatment of Undulant Fever

The increased recognition and incidence of undulant fever has fortunately been associated with new and improved methods of treating this disease, in both its acute and its chronic form. Vaccines have been employed for about ten years, in many instances with apparent success. Convalescent serum and transfusion with whole blood have also been reported as sometimes successful in the treatment of the disease. During the past year favorable reports of the treatment of undulant fever with sulfanilamide or its compounds have rapidly accumulated. From the information available it seems likely that sulfanilamide in rather large doses is necessary but that at least in some resistant cases the results are comparable, if not superior, to any other form of treatment of undulant fever thus far proposed. Successful results have also been claimed for physically induced hyperpyrexia treatments, and the intravenous administration of neoarsphenamine. Although a decision as to the value of any method of treatment in undulant fever is difficult because of the alternation of febrile periods and afebrile pauses, the available methods of therapy are such as to allow the disease to be met with a much more powerful therapeutic armamentarium than existed a few years ago. (J.A.M.A., Nov. 5, 1938, p. 1769.)

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of February 8, 1939

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, February 8, 1939. Dinner was served at 7 o'clock and the meeting was called to order at 8:10 p. m. by the president, Dr. Carl B. Drake.

There were forty-eight members present.

Minutes of the January meeting were read and approved.

The secretary read two proposed amendments to the Constitution which will be published in the next program and voted upon at the March meeting.

The scientific program followed.

TROPICAL AND NONTROPICAL SPRUE (CHRONIC IDIOPATHIC STEATORRHEA) THEIR PROBABLE INTERRELATIONSHIP*

Albert M. Snell, M.D.

Rochester, Minnesota

Dr. Albert M. Snell, of Rochester, read his inaugural thesis on the above subject. Lantern slides were shown.

Abstract

Sprue has been defined by Frederic Hanes as "a chronic deficiency state with a marked tendency to remissions and relapses characterized, when fully developed, by glossitis and stomatitis, anorexia, gastrointestinal indigestion, by the passage of large, fatty, frothy, foul-smelling stools, by great loss of weight, generalized muscular wasting and, in adults and some children, by macrocytic-hyperchromic anemia. It responds promptly to liver therapy."

The disease was formerly supposed to be confined to the tropics, but in recent years a considerable number of cases have been reported from temperate climates. At the Mayo Clinic, we have had an opportunity of seeing a group of "imported" cases of tropical sprue and have compared the signs and symptoms present in these cases with those in cases in which the disease was acquired in northern latitudes. Records of eighteen patients with non-tropical sprue have been examined and in each case the clinical picture and the response to treatment with liver extract was identical with that seen in cases of tropical sprue.

We also have records of fourteen patients whose condition had no bearing on tropical residence and who presented the characteristic signs of sprue (steatorrhea, macrocytic anemia and glossitis) and in addition a variety of metabolic and nutritional disturbances, including tetany, osteoporosis, growth defects, hypoproteinemia with edema, pellagra, hemorrhagic states, pigmentation of the skin, subacute combined degeneration and other less common nutritional disturbances. Hypovitaminosis D is a conspicuous feature. These cases correspond to a condition which has been described in the English and Scandinavian literature as "idiopathic steatorrhea." They appear to represent the end results of long-continued intestinal dysfunction with failure of absorption of the necessary minerals and vitamins. Certain of the patients responded in satisfactory manner to parenteral administration of liver extract although large doses and persistent treatment were required.

Observations of individual cases from both groups over long periods of time bring out some interesting points. Neither sprue nor "idiopathic steatorrhea" is a static condition and in certain cases the basic condition, that is, sprue, has been seen gradually to give rise to multiple symptoms of deficiency related to loss of minerals, vitamins and essential foodstuffs. In these cases, seen in the stage of transition, treatment with liver extract may still be extraordinarily effective. The difference between sprue and steatorrhea appear on the whole to represent different stages in the breakdown of the absorptive function of the small intestine, but the two conditions do not differ fundamentally. The distinctions which have been made between them in the past appear to be largely artificial and the intractable nature of so-called "idiopathic steatorrhea" appears to be largely a matter of delayed diagnosis and inadequate treatment. The syndrome of sprue and its immediate and late sequelæ are not uncommonly encountered in temperate climates and their earlier recognition and treatment would largely eliminate those cases which now present the advanced and intractable types of metabolic and nutritional disturbances.

Nontropical sprue should be diagnosed without difficulty if its existence is borne in mind. The principal conditions to be distinguished from it are gastrojejunocolic fistula, mesenteric lymphadenopathy and various types of pancreatic disease.

Discussion

Dr. Irvine McQuarrie (U. of M.): This is almost identical with celiac disease we see in children in some of our clinics. It is not very common but practically every children's clinic has a few cases. We recognize two rather distinct forms which are superficially alike. One occurs under two or three years of age. The mortality is very high in this group. In them, there is chronic cystic pancreatitis associated with chronic fibrosis of the lungs. Then there is another group in which there is no demonstrable pancreatitis but the stools have the same gross appearance. In such children in either group the dietary deficiencies most frequently observed are in Vitamins A, D, and sometimes C, and possibly B. I cannot recall having seen cases showing hemorrhagic tendencies, which would indicate absence of K, but they may occur. I can recall having seen two cases of celiac disease with xerophthalmia and rickets. One group of cases gets well on a high-protein, high-vitamin diet, while the other group responds unsatisfactorily to all forms of therapy. These latter cases with cystic pancreatitis have more neutral fat in the stools than do the genuine celiac cases. In these, soaps and free fatty acids predominate in the stool. There is probably still another group of celiac cases which fit into the sprue series.

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*Division of Medicine, The Mayo Clinic.

I would like to congratulate Dr. Snell on the excellent presentation of this subject. I often wish that our students and young clinicians at the University could emulate this type of presentation.

I would like to ask Dr. Snell to express his views regarding the etiology of nontropical sprue or to make a brief evaluation of the current theories concerning its etiology. It was once thought that monilia or some organism of that nature has made sprue more frequent in the tropics than in the temperate zones.

Dr. Snell (in closing): I am grateful to Dr. McQuarrie for this discussion, and particularly for his comments on the relation of pancreatic atrophy to certain forms of celiac disease. In the adult, chronic pancreatitis with destruction of the acinar tissue of the organ may simulate sprue closely. If a fatty liver which may develop in the course of pancreatic atrophy makes its contribution to the clinical picture, the diagnostic difficulties are multiplied. The case reported by Norris, Beard and Gerber in the Archives of Pathology, December, 1938, is an example of this problem.

The principal reliance in distinguishing pancreatic disease from sprue is placed on the glucose tolerance test; the rises in blood sugar are characteristically of diabetic type in pancreatic disease, while in sprue a very small rise (20 mg. per cent or less) is the rule. A study of the enzymatic activity of the duodenal content is also of diagnostic value, since the pancreatic enzymes are only slightly reduced in sprue.

The etiology of sprue is still undecided. It is a deficiency disease in somewhat the same sense as is pernicious anemia. In its uncomplicated form, it responds in a specific manner to parenteral administration of liver extract; when multiple symptoms of deficiency appear, liver extract will correct the anemia of the disease but it does not necessarily control the fatty diarrhea or cure the intestinal dysfunction. The latter factor, that is, loss of the absorptive function of the small intestine, is the fundamental lesion in sprue although a constant pathologic picture has not been demonstrated. One, therefore, must postulate a physiologic failure of some sort. A constitutional factor has been invoked and Verzar has even attributed the intestinal dysfunction to a specific failure of cortical adrenal function. Such a breakdown does actually occur as a terminal feature in the adrenalectomized animal and, curiously enough, sprue itself may respond to some extent at least to cortical hormone. Many additional data are needed to clarify this point and, for the present, sprue and its related syndromes are best regarded as deficiency diseases. Monilia, incidentally, has nothing to do with the condition. Why sprue is more common in certain endemic areas in the tropics than elsewhere never has been explained satisfactorily; until it is known why this is so, further extension and revision of ideas concerning etiology are to be expected.

PARALARYNGEAL ATHEROMA

Arnold Schwyzer, M.D.

Saint Paul

The first case I want to report is of interest only as to its etiology. It was a simple little atheroma, but its location proved it to be due to an embryological remnant of a gill cleft. The gill clefts are the depressions, as seen from the outside, between the branchial arches which form the sides of the neck. Seen from the inside there are also depressions between these branchial arches; they are called the pharyngeal pouches. Ectoderm and the entoderm of the foregut come into direct contact between the branchial arches. There is no mesenchyme separating these two fine epithelial layers, and perforation may, therefore, occur very easily as it does normally in fishes. Embryogenic remnants are seen quite frequently on the neck, due either to persistent ectodermal or entodermal cells. We then have congenital cysts of fistulæ. If the remnant is derived from the pharyngeal pouch, the epithelium is cylindrical and it is resting on lymphoid tissue; while ectodermal formations are lined with a stratified pavement cell epithelium. The second and third branchial arches grow much larger than the lower ones and overlap the latter downward. By this, an ectodermal pocket is formed called the cervical sinus. An enclosed epidermal remnant growing into a macroscopic atheroma may thus be due to a remnant of a branchial cleft or of the cervical sinus.

The atheroma which we encountered four weeks ago was not one of those very common atheromata which, in the upper portion of the neck, are quite commonly found in the midline and represent superficial formations. The cystic mass under discussion was deep-seated laterally below the submaxillary gland. It was reached only by cutting the sternohyoid and omohyoid muscles near the hyoid horn. Its size was that of a large cherry and it rested to the side of the larynx on the sheath of the large vessels. It was, therefore, a remnant of a gill cleft. (Slides shown.) The cervical sinus in the fully-formed child opens, if it is persistent, low down on the neck near the head of the clavicle.

MESENTERIC LYMPHADENITIS

Case Reports

Arnold Schwyzer, M.D.

Saint Paul, Minnesota

Dr. Schwyzer reported two cases of mesenteric lymphadenitis, as follows:

Case 1.—Miss L. B., twenty years old, had an appendectomy for an acute appendicitis. After the operation she was free from her previous abdominal pain for about a month and then it reappeared as a dull pain after meals. Six months after the removal of the appendix the condition became acute one night. The pain was severe and she vomited several times. In the morning she was taken to the hospital. The tenderness was principally in the epigastrium and a perforating ulcer seemed the most plausible diagnosis. After watching her for a couple of hours, during which time other work had to be done, the tenderness and pulse, which at first had improved a trifle, were not enough better to wait longer. An incision was made a little to the right of the midline over the upper abdomen. The stomach, duodenum, and gallbladder were normal. The hand was introduced into the lower abdomen and found in the pelvis a stiff ballooned bowel loop of dark blue color. It was strangulated, as my sketch (Fig. 1) shows, by a rather thick cord which ran from the root of the meso-ileum over to the mesosigmoid. Between this firm band and the posterior abdominal wall, the bowel loop had slipped down toward the pelvis. On manipulation the attachment of the constricting cord broke away from a roundish mass of the size of a small walnut at the root of the meso-ileum. The raw surface was grayish-reddish with some gray specks here and there. It was an enlarged infected and partly broken-down lymph node. The constricting band was cut away from the mesosigmoid; the bowel loop became less tense and of good color. What should be done with the broken-down lymph node? We figured that the infection was an old one because the drawing out of the adhesion must have taken a long period of peristaltic pulling and because there was no fibrin deposit or other sign of more recent inflammation. Excision was not desirable as it might stir up the old infection and some blood in the bed would readily become infected. We relied on the defensive power of the peritoneum if given proper chance by not damaging it. We laid the meso-ileum, which was directly above this raw surface, over it and closed the abdomen. Convalescence was smooth and the patient has remained symptom-free. She is now married and has had three children.

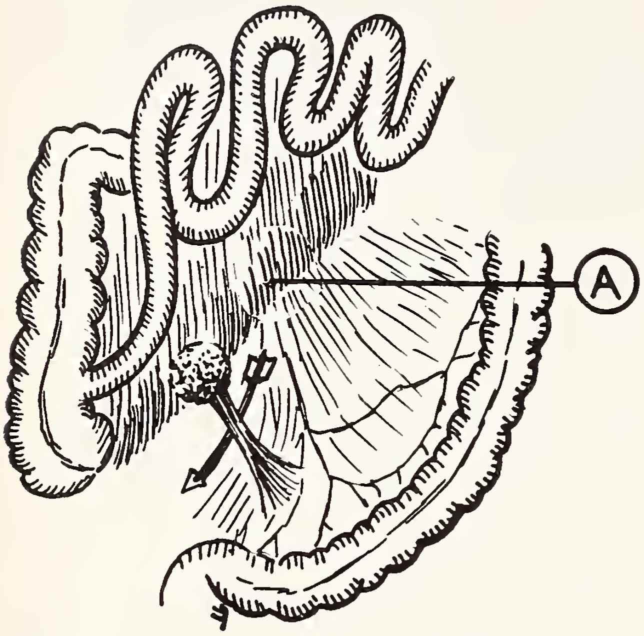

Fig. 1. Lymphadenitis with partial necrosis. Perilymphadenitis adhesion to meso-sigmoid, drawn out into cord under which a small bowel loop became strangulated. *A*, root of meso-ileum.

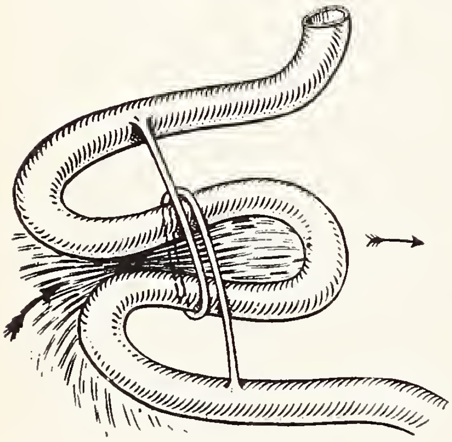

Fig. 2.

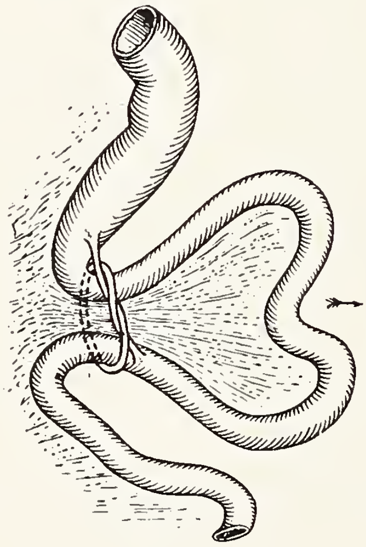

Fig. 3.

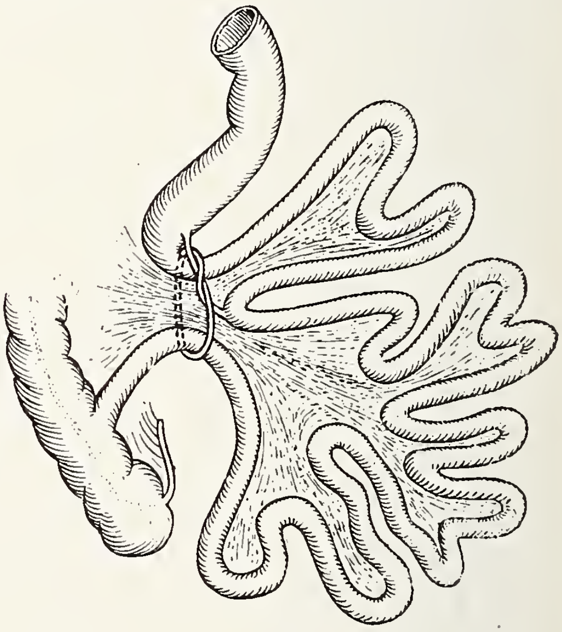

Fig. 4.

There were no other lymph nodes of enlarged size noticed and the microscopic examination of the end of the constricting cord, containing some of the lymph node tissue, showed no tuberculosis.

The most plausible explanation, in the absence of other findings, appears to be that at the time of the appendicitis there had existed an acute lymphangitis and a partial suppurative lymphadenitis in the gland under consideration. With the removal of the appendix, the infection gradually cooled off; the peritoneum had become agglutinated, walling off the focus and then gradually this adhesion, which had been quite bulky, was drawn out into a cord. But the cord was stretched only to a short length extending merely from the root of the meso-ileum to rather near the base of the mesocolon. Only the peristalsis of the colon caused any pulling and not for any great distance.

As a rule, such adhesions when greatly lengthened draw out into quite thin strings.

I may be forgiven for a slight digression in mentioning two extraordinary cases. In one, such a cord had strangulated practically the whole small intestine. It had formed of an adhesion near the root of the appendix. The whole ileum and most of the jejunum were black and enormously ballooned. These guts had to be watched for fully fifteen minutes while kept in warm pads, before we dared replace them. Fortunately, the patient made the grade.

When the adhesion is attached, at least at one end, to the small gut itself it may become stretched very much and a rather long thinned-out string may be the result. When I was still pathologist to the City and County Hospital I had an opportunity to make an autopsy on a very interesting case of this kind. (St. Paul Med. Jour., Feb., 1901.) The constricting band was 7.5 cm. long. It was attached at both ends to points on the ileum. By accident, a loop had formed by this cord and a small segment of ileum entered it. A true knot then was accomplished (Figs. 2, 3 and 4) when the gut with the lower attachment of the cord was pulled in through the ring. It appears that in these cases it is always the lower (efferent) segment which slips in further and further due to the peristaltic action of the entrapped gut. Imagine a rubber band around one end of a wet sausage skin which is now blown up. The end becomes stretched out and the rubber band has the tendency to be pushed off through the pulling action of the distension. By such pulling action, you see a long stretch of gut entered through the strangulating ring, and it is all from the lower side. In the same way, peristalsis at the afferent loop would tend to free the gut. The mesentery of a given segment of bowel is less bulky nearer the root, inasmuch as it measures 20 feet at the gut while its base is only 15 centimeters long. We find, therefore, a tendency of the constricting ring to slip toward the base of the mesentery while more and more gut enters the constricting ring. My sketch (Fig. 4), of course, is quite schematic; the strangulated gut measured 5 feet.

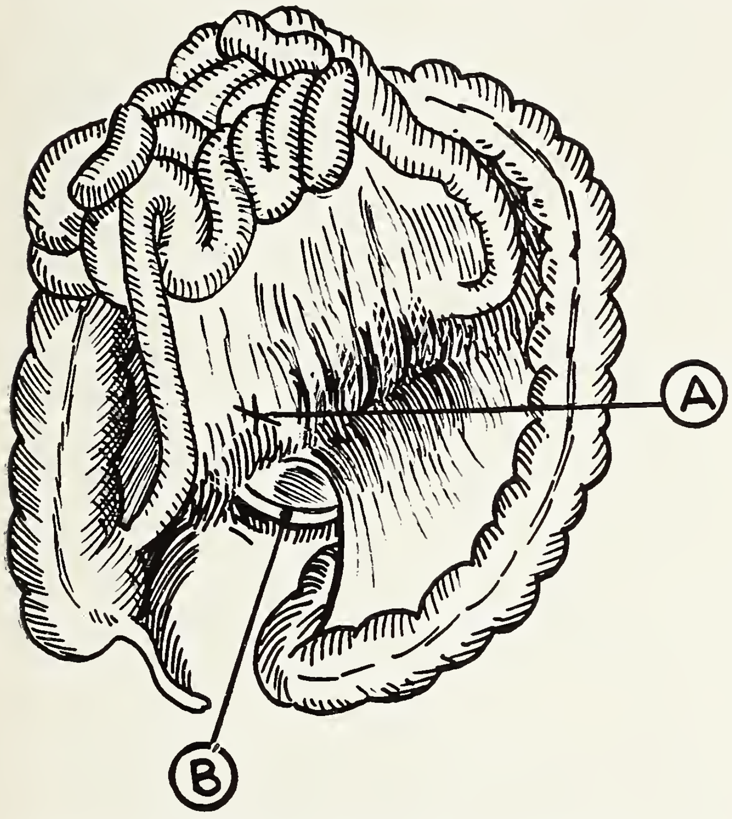

Fig. 5. Lymphadenitis putrid abscess of mesentery, acute appendicitis. *A,* location of abscess; *B,* promontory.

Case 2.—While the first case described was a late effect of a lymphadenitis of the base of the mesentery, the one to be discussed now is that of an acute condition of this kind. A woman, fifty-four years old, was admitted to St. Joseph's Hospital on the afternoon of December 27, 1938, as a case of acute appendicitis. Her history was not very clear. She had been more or less ill for two months and considered it "flu." She had been coughing for the last two weeks. On the evening of the day before entering the hospital she was seized with severe pain in the lower abdomen and took a laxative. She felt very sick and vomited frequently during the night and the morning.

The patient appeared very ill. The abdomen was a little bloated; tenderness existed in the right iliac and in the lower mid-abdomen. Palpation was, of course, very light but there was only moderate muscle defense on palpation at McBurney's point though the whole abdomen was somewhat rigid. Subjectively, the most pain was in the lower central abdominal region. The temperature was 100.2°, leukocytes 19,450, and the urine was practically normal. The acuteness of the picture did not allow of any delay and she was operated upon that same afternoon. In perfect anesthesia with spinocain, a gridiron incision, five centimeters long, was made a little below McBurney's point. The appendix was quite markedly reddened but there was no fibrin on it. It was removed. The palpation of the pelvis showed a normal condition. It was clear that this free, though red, appendix could not explain the severity of the onset and the tenderness of the mid-abdomen. The next move was to look for a possible trouble with a Meckel's diverticulum. Following the ileum upward from the cecum we noticed that the meso-ileum was short and thick. Replacing always the piece of gut examined, we worked up on the gut for a little over a foot when we encountered a foul abscess which the lifting of the gut had apparently broken. There was a strong coli odor. Immediately, the pus was caught in gauze and the pelvis protected. After mopping the parts dry, inspection showed that the abscess cavity had been about the size of a large plum and was located at the very root of the mesentery (Fig. 5). Drainage of this very foul, localized peritonitis had to be accomplished as much away from the free general peritoneal cavity as possible. A thin rubber tube and two collapsible rubber drains were placed so that their course from the abscess to the surface did not come into contact with the small guts, by laying the mesentery of the adjoining ileum over the drains and pulling the very large cecum mesially by a catgut stitch to the peritoneum of the anterior abdominal wall (Fig. 6). By keeping the patient strictly in the prone position for about five days, the postoperative course was rather smooth, though, of course, for the first days the discharge was profuse. Ten days after the operation the patient was up in a chair and she left the hospital on January 16.

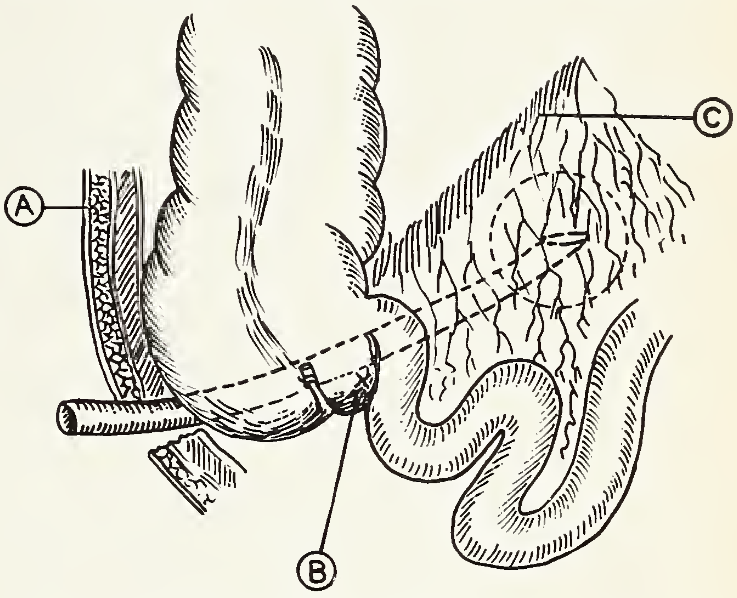

Fig. 6. Same as shown in Figure 5. *A,* abdominal wall; *B,* cecum fixed to anterior abdominal wall by catgut stitch, which pulls it over toward midline, thereby keeping the drainage tract away from the small bowel and free peritoneal cavity.

The favorable outcome was undoubtedly due to what amounted practically to an extraperitoneal course of the drainage tract and to the prolonged prone position to which the patient submitted without complaint.

What was the cause of this coli bacillus abscess? The appendix was not in any direct contact and was even a marked distance from it. The coli bacillus must have entered from somewhere on the mucosal surface of the gut. No other area except the appendix could be incriminated. The lymphatics of the appendix partly run up along the inner side of the cecum and partly toward the lymph nodes of the root of the meso-ileum, while some less-traveled roads lead, in women, toward the ovarian system.

The examination of the appendix under the microscope, definitely cleared the question as to the original source of infection. The pathologist's report (Dr. Maun) reads in part—"Lumen almost completely obliterated. About the vessels of the serosa are large numbers of inflammatory cells consisting of macrophages, lymphocytes, and a few neutrophiles."

The findings are those of a recurrent, acute, though not very destructive, appendicitis.

The meeting adjourned.

A. G. Schulze, M.D.
Secretary

SAFER MATERNITY—A TRIUMPH OF DEMOCRACY

We think the triumphs of democracy for human happiness stand up well when contrasted with the results achieved by the totalitarians—and they need to be publicized. Saving the lives of mothers and babies in childbirth by self-criticism and self-discipline is one good example from the field of public health of the Spirit of America.

For twenty years the maternity death rate was stagnant—despite rapid advances in the science of obstetrics. The reason was that the mothers of America were not receiving the care they needed. They died at the highest rate in the civilized world. Then it was that interested citizens began to cry out against this needless waste of life. Newspapers and magazines took up the chorus.

The medical profession in various communities began to study maternal deaths and to look into the reasons why mothers died. It was found that a large share of the blame must be placed upon the doctor's shoulders. Poor training in medical schools, obstetrical short cuts, failure to keep abreast of advances, carelessness, were some of the reasons publicly ascribed to these needless maternity deaths. The doctors, however, did not pussyfoot but willingly accepted this responsibility. Immediate efforts were made to improve the standards of care given to expectant mothers. County medical societies held special courses for those doctors doing obstetrics; efforts were made to improve the teaching of this science in the medical schools; and in a number of communities each maternal death was studied to determine how it might have been prevented. No coercion there. It was a responsibility willingly accepted for the sake of mothers and babies.

Nurses, too, sought to improve the care given during pregnancy, at birth, and afterward. The American Hospital Association studied that phase of the problem and recently announced in no uncertain terms: "A poorly managed, ill-equipped, carelessly supervised hospital is the worst place on earth for a woman to have a baby," but added, "A high grade hospital with a properly planned and well-supervised maternity department is the safest and best place for childbirth." Efforts have been made to improve maternity care given in hospitals. Many new maternity clinics have been opened with public and private funds.

All of this has cut right across lines of race and color and creed. Rich and poor have benefited alike. All of these efforts have been based upon a humanitarian purpose. They were launched not to provide more cannon fodder but for the sake of life and health and happiness of mothers and babies and for the sake of healthy family life.

What has been the result? The maternity death rate is no longer stagnant. It is falling steadily, and in many states is falling rapidly. In Connecticut, Rhode Island, and New Jersey, where this coöperation and self-criticism has reached its peak, the maternal death rate is far below the national rate.

The Nazis and the Fascists and the other totalitarians may rage at the enemies of their regimes, may carry on cold-blooded persecutions of women and children; but here in the United States we are achieving a victory against death and disaster for the sake of our mothers and babies, the very future of this nation!—Briefs, Maternity Center Association, January, 1939.

MINNEAPOLIS SURGICAL SOCIETY

Stated Meeting, Thursday, January 5, 1939

Dr. George R. Dunn, President, in the Chair

CARCINOMA OF THE PANCREAS

An Analysis of Forty-seven Treated Cases from the Lahey Clinic in Boston

D. C. MacKinnon, M.A., M.D.*

Minneapolis

Carcinoma of the pancreas is not a common form of malignant disease. It constitutes only 1 to 2 per cent of all carcinomas. In the management of this disease, difficult problems of diagnosis and treatment are encountered. From this investigation little can be added to the present knowledge of the symptomatology and diagnostic methods. However, the end-results of the surgical and radiation therapy in a small series of cases are of interest, but not very encouraging from the standpoint of accomplishing anything comparable with the results of surgical treatment of carcinoma in some of the other parts of the body.

This analysis includes forty-seven cases of carcinoma of the pancreas in which operation was performed at the Lahey Clinic, with a follow-up note in all patients until the time of death. The series does not include all cases with the operative diagnosis of carcinoma of the pancreas. A few cases with incomplete follow-up data and a number without convincing operative findings were excluded. Likewise, a few cases with obstructive lesions of a presumed malignant character in which the patient was restored to health following cholecystenterostomy were also excluded. Obviously, these lesions were not malignant in nature, and probably were cases of chronic pancreatitis or silent common duct stone associated with pancreatitis.

In thirty-five cases the diagnosis was made from a satisfactory operative description of the gross pathologic change as observed by an experienced surgeon. Of the remaining cases, seven were proved at biopsy and five at autopsy to be carcinoma of the pancreas.

The average age of these patients was fifty-six years, with the range from thirty-one to eighty years. All of the cases except four were equally distributed in the fifth, sixth, and seventh decades. There were twenty-three males and twenty-four females, a higher incidence of females than is usually found in most reports. A ratio of males to females of 3 or 4:1 is more common than the ratio found in these cases.

The average duration of the disease before admission to the clinic was 3.6 months, with the range from one to nine months. Pain frequently preceded the onset of jaundice. It was not until the pain, anorexia, and loss of weight became progressively worse, or jaundice appeared, that most of these patients came for treatment.

In the order of their frequency, the most common symptoms of carcinoma of the pancreas were weight loss, anorexia, pain, jaundice, nausea, and vomiting. Loss of weight was present in 85.1 per cent of the cases. There was no record of weight loss on the records of five patients. The average amount of weight loss was 22.7 pounds, with the range from eight to seventy-two pounds. Anorexia was reported in 82.9 per cent of the cases. Pain was present in 76.5 per cent of the patients. It occurred in the epigastrium in twenty-seven cases, in the right upper quadrant of the abdomen in eleven, and in the back in seventeen, either in one or in a combination of two or more regions. Jaundice was present in 59.5 per cent, and pruritus in 25 per cent of the patients with jaundice. Nausea occurred in 21.2 per cent, and vomiting in 17 per cent.

On physical examination, abdominal tenderness was elicited in 36.1 per cent of the patients, occurring in the epigastrium in five, and in the right upper quadrant in twelve. There was no relationship between tenderness in the right upper quadrant and the presence of distention of the gallbladder. An abdominal mass was palpable in 55.3 per cent of the cases; it was found in the right upper quadrant in eighteen, in the right upper quadrant and epigastrium in three, and in the epigastrium in five. Clinical errors in palpation were frequently observed, particularly when the cause of the masses was noted in the record of the physical examination. Nevertheless, in eighteen to twenty-one cases with right upper quadrant masses, the operative findings showed that the gallbladder was markedly distended in all of these cases.

The roentgenographic findings of extrinsic pressure on the stomach or duodenum, duodenal stasis, or widening of the duodenal loop, are valuable diagnostic data. Gastro-intestinal roentgenograms were taken in twenty-one cases; six were negative, seven showed extrinsic pressure or stasis with no widening of the duodenal loop, and eight showed widening of the duodenal loop without extrinsic pressure or stasis. Therefore, positive roentgenologic findings were noted in 71.4 per cent of the cases in which roentgenograms were taken. Such a valuable diagnostic aid should be used more frequently when carcinoma of the pancreas is suspected.

When the common bile duct is involved, additional diagnostic evidence may be obtained by examining and demonstrating the absence of bile or the presence of blood in the duodenal drainage. Duodenal drainage was done in only seven cases, but in all of these cases bile was notably absent, and in two cases blood was obtained. It must be remembered that primary carcinoma in the common duct may give similar findings.

From the operative findings, there was distention of the gallbladder in 63.9 per cent of the cases. Metastases occurred locally or to the liver in 31 per cent. The primary growth involved the head of the pancreas in thirty-eight cases, the body in two, tail in one, entire gland in four, and the pancreas, stomach and transverse mesocolon in two cases. Stones were present in the gallbladder in three cases. In the patients with associated cholelithiasis, one was jaundiced, and the gallbladder was distended, while two were not jaundiced, one with and one without gallbladder distention, showing that stones occurred in two cases in which the gallbladder was capable of distention.

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*By invitation.

A biopsy was performed at the time of the operation in ten cases; the pathologist's report was positive in seven. All four specimens taken from the metastases to the liver showed microscopic evidence of metastatic carcinoma simplex. Four specimens were taken from the primary growth in the head of the pancreas, two were reported as adenocarcinoma, one atrophic pancreas, and one fibrous tissue with chronic inflammation. In two cases a lymph node was removed from the gastrohepatic omentum; one showed adenocarcinoma and the other simple hyperplasia. The biopsies were probably not satisfactory in the three cases with negative reports. Since the operative description of the gross pathologic change was convincing in these cases, they were included in this report. Granted that these patients are often poor operative risks, and that there are certain technical difficulties in performing a biopsy, this procedure seems justified whenever it can be accomplished without too much additional risk. When a correct diagnosis can be made, postoperative management can then be instituted more intelligently.

Considerable attention has been given to the presence of painless jaundice and distention of the gallbladder in making a diagnosis of carcinoma of the pancreas. Since pain was present in 76.5 per cent of the cases, and this figure agrees with other reports, certainly the disease cannot be painless in the majority of cases. The pain associated with this lesion is, however, much less severe than that associated with gallstone colic. Less than two-thirds of the cases showed jaundice and distention of the gallbladder. When these two factors are present, they are important diagnostic aids, indicating obstruction of the common bile duct, but they may never occur or may appear as late manifestations of the disease, especially when the primary growth in the pancreas is some distance from the common bile duct. Anorexia, progressive weight loss, and a dull pain in the epigastrium or right upper quadrant of the abdomen, boring through to the back under the angle of the right scapula, are more suggestive symptoms of this disease.

Pain is not entirely due to the distention of the gallbladder, since there is no definite relationship between these two factors in this series of cases. In thirty patients with distention of the gallbladder, nineteen gave a history of pain, and eleven had no pain, while all of the patients without gallbladder distention had pain. Pain is probably due to pressure and distention produced by the primary growth in the pancreas.

In twenty-eight cases with jaundice, there were three exceptions to Courvoisier's law, that the gallbladder is distended in malignant or noninflammatory obstructions of the common bile duct. The three cases in which the body and tail of the gland were involved, and those with associated cholelithiasis, were not in this group; therefore, no explanation can be given for these exceptions. In nineteen cases in which jaundice was not present, the gallbladder was distended in five and there was no distention in fourteen, which is even more confusing.

Weight loss was a frequent symptom definitely associated with anorexia and probably caused by a disturbance of pancreatic function. In twenty-five patients with jaundice, the average weight loss was 24.7 pounds, and in fifteen without jaundice the average loss of weight was 19.5 pounds. Although the average loss of weight was five pounds more in the jaundiced patients, the difference does not seem sufficient to conclude that jaundice caused the loss of weight. In thirty-two patients with pain and eight without pain, the loss of weight was 22.4 and 22.8 pounds, respectively, indicating absolutely no relationship between pain and weight loss.

A number of surgical procedures were used in the management of these cases. The procedures and the number of times they were performed are indicated in the tabulation.

TABULATION

Procedure	Number of Cases
Abdominal exploration (7 biopsies)	15
Cholecystogastrostomy (2 biopsies)	7
Cholecystogastrostomy and posterior gastro-enterostomy	1
Cholecystoduodenostomy	2
Cholecystojejunostomy	12
Cholecystojejunostomy and choledochostomy	2
Choledochostomy	2
Choledochostomy and cholecystostomy (1 biopsy)	2
Cholecystostomy	3
Posterior gastro-enterostomy	1
Total	47

Since nine patients died shortly after operation, the operative mortality was 19.1 per cent. Only two deaths occurred following abdominal exploration, and seven deaths were related to more extensive operative procedures. The contributory causes of death were cachexia in four cases, pneumonia in two, peritonitis following perforation at the suture line of a cholecystojejunostomy in one, hemorrhage in one, and hemorrhage and pneumonia in one case. Hemorrhage was infrequent in this series of cases, occurring only twice, and resulting in postoperative fatalities. Carcinoma of the head of the pancreas was the primary cause of death in all five cases in which an autopsy was performed.

Radiation therapy was instituted in eight cases after the patients had recovered from their operations. A cholecystenterostomy was done in five of these cases, and abdominal exploration in three. There was a marked individual variation in the amount of radiation therapy used; nevertheless it seemed worth while to consider these cases as a group and to make comparisons.

The average length of life in the thirty-eight patients who survived the operation, disregarding their methods of management, was eight and six-tenths months. Cholecystenterostomy was done in fifteen cases without radiation therapy, with an average duration of life of eight and six-tenths months. One patient in this group lived for fifty-four months after operation, but finally died of the disease. Excluding this unusual case, the average duration of life was 5.4 months in this group. Radiation was administered to five patients on whom cholecystenterostomy had been performed, with an average length of life of seventeen months. In ten cases in which an abdominal exploratory operation was performed and radiation was not given, the average length of life was 4.7 months. In three cases with radiation after abdominal exploration, the average was 16.6 months. Disregarding the surgical procedure used, the average duration of life in the eight patients who received radiation therapy was 16.8 months. Cholecystenterostomy relieved the jaundice and also the itching when pruritus was associated with jaundice. Cholecystenterostomy as compared with abdominal exploration did not produce a significant increase in the duration of life. However, when radiation therapy was used, there was a significant and proportional increase in the duration of life in both series of cases.

Of two patients who received radiation therapy, one had a cholecystojejunostomy, the other an exploratory laparotomy and biopsy with a positive report; these patients lived for forty-one and forty months, respectively. After radiation they showed marked improvement, with periods of excellent health. There was much less pain, a gain in weight and strength, and the epigastric mass was definitely reduced in size. Roentgenologic studies in one of these cases revealed a definite displacement of the duodenum, and after radiation a normal contour was found on repeated examinations. With such favorable results, this form of treatment should be used more frequently than it is at present. With added experience in radiation therapy more can be done for these patients in the future than has been done in the past.

When there is obstruction of the common bile duct below the point where the cystic duct enters, it is distinctly worth while to anastomose the gallbladder to the intestinal canal and relieve the patient of that type of carcinoma discomfort associated with jaundice.

At the Clinic, three types of palliative operation have been employed, cholecystogastrostomy, cholecystoduodenostomy, and cholecystojejunostomy. Of these procedures, only the latter one has been employed for some years. Cholecystogastrostomy is an undesirable surgical procedure, since the powerful peristaltic waves of the stomach can propel the gastric contents through the new opening into the smaller bile passages. Another disadvantage is that the wall of the stomach is thick, with a loose redundant mucosa which makes it difficult to accurately anastomose the stretched-out, thin-walled gallbladder to the stomach. When one realizes, also, that on one side of the anastomosis the stomach may move in deep peristaltic waves with digestion or vomiting, it is evident that the suture line must be exposed to considerable strain at times.

Likewise, there is a disadvantage in anastomosing the gallbladder to the duodenum. Both structures are relatively fixed so that accurate approximation and anastomosis may be difficult and at times uncertain. The duodenum is partly extraperitoneal and so does not permit of easy mobilization, so the gallbladder must be made to migrate to the duodenum. Here again the rise and fall of the liver with diaphragmatic motion which at times is of quite violent character, with vomiting, must jeopardize the security of this suture line.

Cholecystojejunostomy is the procedure which is used more frequently and has overcome the objections raised about the other two procedures. It is occasionally true that this procedure cannot be utilized when the mesentery of the jejunum is too short to permit the jejunum to comfortably reach in front of the hepatic flexure to the gallbladder. Cholecystojejunostomy is accomplished with a double row of sutures as in gastro-enterostomy. After the anastomosis is completed, a silk stitch is placed proximal and distal to the anastomosis between the jejunum and the capsule of the liver. These stitches so fix the anastomosed jejunum to the liver that it ascends and descends with any motion in that structure, taking all strain off the suture line. This is an important point when one realizes that many of these anastomoses must be made with a stretched-out gallbladder wall of almost paper thinness, and one from which stitches will tear very easily. The thinness of the jejunal wall is such that it makes the suture of these two structures easier.

In patients who have had jaundice for a long time and are poor operative risks, the employment of cholecystostomy through a small incision under local anesthesia, with later anastomosis of the gallbladder to the jejunum, has made it possible to accomplish successfully cholecystojejunostomy in patients who would not be able to stand it without this preliminary measure.

In conclusion, it is desirable to obtain a specimen at biopsy in patients suspected of having carcinoma of the head of the pancreas, to settle the matter of prognosis, and to settle the question of postoperative roentgen therapy.

Postoperative roentgen therapy definitely prolongs life in patients with carcinoma of the head of the pancreas in this series of cases.

The roentgenologic evidence of extrinsic pressure and widening of the curve of the duodenum is of value in the diagnosis of carcinoma of the head of the pancreas.

Anastomosis of the jejunum to the gallbladder instead of the stomach or duodenum is an easier and safer procedure than anastomosis of the two latter structures to the gallbladder and is functionally just as satisfactory.

I wish to thank Dr. Frank H. Lahey for the privilege of presenting this paper.

LYMPHOSARCOMA OF THE INGUINAL GLANDS

Case Report

G. R. Dunn, M.D.
Minneapolis

This patient was first seen on September 26, 1935, with a subcutaneous mass, rather irregular, firm and of a rubbery consistency, in the right groin. The white blood count was 7,100, polymorphonuclears 76 per cent, lymphocytes 20 per cent, monocytes 3 per cent, eosinophils 1 per cent. The urine was negative.

On September 26, 1935, a complete blood count was also done by Dr. Floyd Grave. The hemoglobin was 88 per cent, red blood cells 5,120,000, leukocytes 11,000, polymorphonuclears 69 per cent, lymphocytes 26 per cent, monocytes 5 per cent.

Blood taken for agglutination tests on September 28 was negative for typhoid, paratyphoid A and B, melitensis and tularense. Agglutination test was atypical in a dilution of 1 to 200 for the dysenteriæ Flexner, negative for the Shiga.

Radiographs of the lower lumbar spine and pelvis were negative for fracture, dislocation, bone injury, or disease.

Two Wassermann reactions were negative at the University of Minnesota.

The patient finally decided to permit an operative procedure and was operated on October 23, 1935. The tumor was removed en masse with a layer of underlying fascia.

Dr. McCartney of the Pathological Department of the University reported as follows: "The tumor from L. K. is oval, about 6 x 4 x 4 cm., quite firm; on section uniform in appearance; some areas of congestion but no gross hemorrhage. Near the main tumor is a rounded mass about 1.5 cm. in diameter and another which is less than 1 cm. in diameter. The smallest one is definitely a lymphnode only partially involved. Sections from the three masses show essentially the same picture except that the smallest mass, which is a lymphnode, is only partially involved. The structure is that of a tumor made of small round cells showing no definite arrangement; numerous mitotic figures are found. The normal architecture of lymphnodes is entirely replaced except in the smallest one. From a microscopic standpoint it is not possible to state whether this is lymphosarcoma or leukemic involvement of nodes. Considering the fact that only a single group of nodes are involved, one is inclined to the diagnosis of lymphosarcoma. A study of the blood would be well worth while to rule out leukemia."

This man received four series of x-ray treatments at Northwestern Hospital. The first series of deep x-ray therapy was started on October 28, 1935, the second on December 17, 1935, the third on February 4, 1936, and the fourth on March 31, 1936.

A radiograph taken of the chest on February 5, 1936, at Northwestern Hospital showed no evidence of pulmonary tuberculosis or other infiltration or consolidation. Conclusions: "Normal chest."

A blood count done on March 26, 1936, showed the hemoglobin to be 102 per cent, red blood cells 5,670,000, white blood cells 6,150, polymorphonuclears 54 per cent, lymphocytes 45 per cent, monocytes 1 per cent.

The man has been examined at intervals since the operation and x-ray therapy were completed. He was last examined on October 18, 1938, at which time a complete physical examination was done. No evidence of recurrence was found. The chest was x-rayed on October 14, 1938, by Dr. R. G. Allison, which showed no evidence of pulmonary tuberculosis or other infiltration or consolidation. Conclusions: "Normal chest."

The operation was done on October 23, 1935. At the present time, January 5, 1939, it is a little over three years with no evidence of recurrence following operative removal and deep x-ray therapy with a pathological diagnosis of lymphosarcoma.

CARCINOMA OF THE JEJUNUM

Case Report

Willard Peterson, M.D.
Minneapolis

Mr. W. B. was first seen on February 25, 1936. At this time he was having severe attacks of vomiting coming on shortly after eating or drinking. There was no pain but only a feeling of epigastric distress. His past history was essentially negative except that he had lost twenty pounds in weight in the last two months.

Examination showed a fairly well nourished male about sixty years old. The head and neck were normal. The heart and lungs were normal. Blood pressure was 145/90. The abdomen was normal for epigastric tenderness; no masses could be made out. Extremities were normal. Hemoglobin was 70 per cent.

He was admitted to Northwestern Hospital, February 28, 1936, and a gastro-intestinal x-ray study was made. Fluoroscopic and plate examination made of the stomach and cap immediately after the ingestion of a barium meal showed the stomach to be normal in size, shape and position. Peristalis was active and passed through the entire stomach. The duodenal bulb filled well and was somewhat dilated. There was a marked dilatation of the duodenum and the proximal few inches of the jejunum. There was a definite obstruction just distal to the duodenal-jejunal junction.

Examination at six hours showed a small portion of the meal in the small intestine. There was a gastric retention. The patient had probably vomited some of the barium. Fluoroscopic and plate examination of the colon showed the fluid to pass readily to the terminal ileum and showed a normal condition.

X-ray Conclusions.—Normal stomach and cap, normal colon. There is definite evidence of obstruction of the jejunum just distal to the duodenal junction. This obstructive process represents a carcinoma.

The patient was prepared for operation by gastric lavage and intravenous solutions, and on March 5, 1936, he was operated upon. A high paramedian incision was made and a small mass was made out in the proximal jejunum which was freely movable. There were no glands involved. About four inches of jejunum was resected with the mass in the center, leaving about 1.5 inches of jejunum on the duodenal side. An end-to-end anastomosis was made with three rows of invaginating sutures and a piece of omentum was sutured loosely over the anastomosis. Gastric syphonage was started at once and he was kept on liquids for about ten days. At the end of two weeks he left the hospital.

Laboratory Diagnosis.—Specimen is a section of the small bowel 7 cm. long, in the center of which is a firm constricting mass 1.5 x 2 cm. On the mucous surface over the mass is a small excavated ragged ulcer 1 cm. across. The lumen of the bowel is two-thirds occluded by the tumor.

Microscopic sections show epithelial cells with irregular gland arrangement invading the muscle and underlying the edge of the mucosa at the edge of the ulcer. Diagnosis: Adeno-carcinoma.

The patient is at present actively engaged as an engineer. He has not only regained his lost weight but has added another twenty pounds. Nearly three years have now elapsed, which is important because statistics show that practically all individuals with adeno-carcinoma of the jejunum are dead by the third year.

Dr. James Johnson has covered the subject very well in his article in the November, 1937, MINNESOTA MEDICINE, and as he is on the program I shall leave the discussion to him.

CASE REPORTS

L. H. FOWLER, M.D., and W. A. HANSON, M.D.

Minneapolis

Malignant Melanoma of Foot

A married woman sixty years of age consulted us on July 16, 1926, on account of a pigmented mole on the dorsum of the right foot. She had been treated for a gastric ulcer for several years, otherwise her past history was negative. She stated that she had had a pigmented mole on the skin of the dorsum of the right foot for twenty years. Two months before her admission this began to grow, and the center became raised and bled easily.

Examination of the right foot showed a pigmented area on the dorsum measuring 2 x 3 centimeters, with a raised hard center which was ulcerated. General physical examination was essentially negative.

Under local anesthesia, this tumor and a wide margin of normal skin was excised. The right inguinal glands were also removed.

Dr. E. T. Bell, Chief of the Department of Pathology of the University of Minnesota, examined the specimen and reported it to be a malignant melanoma. The inguinal glands showed no evidence of malignancy.

This patient was not seen again until June 6, 1934, eight years later. At this time she reported that she had recently recovered from a fractured pelvis, treated by Dr. Raiter, in Cloquet, Minnesota. Examination showed no evidence of any recurrence of the original growth of the foot. She did, however, have an ulcerating skin lesion which was eroding the nose and ear. It was not pigmented but had the clinical appearance of a basal cell epithelioma. No sections were obtained.

The patient lived in another city, where I understand she died from pneumonia complicating an erysipelas of the face.

Comment.—This case is reported to make a record of a patient with a malignant melanoma living eight years after its removal and dying from a complication of a different type of malignancy in a different part of the body.

Myxosarcoma of the Right Chest Wall

A man twenty-three years of age presented himself for examination on October 26, 1926, on account of a small lump on the lower right chest wall. His past history was negative. Two months before admission he noticed a tender nodule under the skin on his lower right chest. This increased in size rather rapidly.

General physical examination was essentially negative.

Over the right eighth intercostal space in the anterior axillary line was a hard, movable, subcutaneous tumor about the size of an English walnut.

On October 28, 1926, under local anesthesia, this tumor was removed. After pathological examination of the specimen disclosed it to be malignant, a larger area of skin, subcutaneous tissue and muscle was removed, and the base of the wound cauterized with the actual cautery. Several enlarged axillary lymph nodes were also removed.

The excised tissue was examined by Dr. J. S. McCartney, Jr., of the Department of Pathology of the University of Minnesota, who reported that the "sections of the tumor show an actively growing myxosarcoma." The axillary glands showed only inflammatory reaction.

The patient made an uneventful convalescence and is alive and well today, over twelve years since the removal of this tumor.

Sarcomatous Degeneration of an Intraligamentous Fibromyoma with Unusual Abdominal Metastasis

A married woman fifty years of age presented herself for examination on May 7, 1936, on account of a mass in the lower abdomen. She had two children, aged eight and nineteen years, living and well. Her past history was essentially negative. For the previous three months, she had felt tired, nervous and had noticed a mass in her lower abdomen. Her menstrual periods had been somewhat delayed and irregular. There had been no intermenstrual bleeding.

The general physical examination was essentially negative except for the findings in the pelvis. On bimanual examination, a large hard irregular mass was felt in the pelvis which appeared to be attached to the uterus. A diagnosis of fibromyomata of the uterus was made and operation advised.

On June 2, 1936, operation was performed at Northwestern Hospital. On opening the abdomen through a low mid-line incision, the whole pelvis appeared to be filled with a large, soft, hemorrhagic, cauliflower-like growth. On further examination this mass was found to have its chief attachment to the base of the left broad ligament. It was adherent to the bladder but was entirely separate from the uterus. The fundus of the uterus was only slightly larger than normal and contained three small fibromyomata measuring from one to three centimeters in diameter. Both ovaries and tubes were normal. There was no evidence of metastases in the liver or abdominal lymph nodes. The tumor mass was removed with some difficulty. A small piece of the bladder had to be excised with the tumor. The bladder wound was closed with two rows of chromic catgut. All bleeding was controlled and the wound closed by layers without drainage. The patient made a satisfactory recovery from the operation.

Examination of microscopic sections of the tumor was reported by Dr. Smith, pathologist of Northwestern Hospital, as follows: "Some areas are definitely myomatous, other areas show myxomatous degeneration. Many areas, especially towards the surface of the tumor, show masses of large hyperchromatic cells, embyronic in spots, with numerous mitotic figures." Microscopic diagnosis: "Myoma with sarcomatous degeneration. Origin probably from the broad ligament."

Several physical examinations during the next twenty-one months showed the patient to be in fairly good health. On March 17, 1938, she returned to us and stated that she had just noticed a slight pain and thought she could feel a "lump" in the left side of her abdomen. Abdominal examination at this time (twenty-one months after the first operation) revealed a small, hard, movable mass in the left mid-abdomen, just above the level of the iliac crest. It felt very much like a low-lying kidney. An intravenous pyelogram with twenty cubic centimeters of diodrast showed an oval shadow in the left lower abdominal quadrant which seemed to be definitely separate from the left kidney. The outline of the kidney pelves and calyces appeared to be within normal limits. Urinalysis was normal.

Examination of the colon after the instillation of a barium enema showed the outline of a kidney-shaped tumor mass in the left mid-quadrant of the abdomen which was displacing the lower end of the descending colon medially. The colon was negative for intrinsic pathology. A chest x-ray was negative for evidence of metastases. A diagnosis of metastatic sarcoma of the left mid-abdomen was made and exploration advised.

On April 7, 1938, the patient was readmitted to Northwestern Hospital and the abdomen opened through a left rectus incision. There was a large, hard, smooth round tumor about six inches in diameter found in the left mid-abdomen. It was freely movable and attached posteriorly to the parietal peritoneum at its reflection onto the descending colon. The omentum was also adherent to the anterior surface of the tumor mass. The uterus was small and contained one small fibromyoma measuring one centimeter in diameter. This was enucleated. There was no evidence of any tumor growth in the pelvis at the site of the original growth or elsewhere. Careful examination of the liver and other abdominal contents revealed no other evidence of metastases. The attachments of the tumor mass were clamped, cut and the mass easily removed. The patient made an uneventful recovery and has had no further trouble to date, which is, of course, only ten months since the second operation and thirty-two months since removal of the original growth.

Dr. J. S. McCartney examined the microscopic sections from this secondary growth and reported them to show "spindle cell sarcoma, possibly leiomyosarcoma." Sections from the primary growth in the left broad ligament show a very similar structure to those of metastatic growth.

Comment.—Many authors state that from 20 to 30 per cent of women past the age of forty years have fibromyomata of the uterus. Relatively few of these undergo sarcomatous degeneration. Much more rare are fibromyomata outside of the uterine musculature and still more rare do we find such a migrating tumor which has become malignant. It is interesting to speculate as to how this isolated, distinct, secondary tumor developed in the free abdominal cavity. Sarcomata are supposed to metastasize through the blood stream rather than via the lymphatics. But I know of no vascular or lymphatic connection between the left broad ligament and the parietal peritoneum of the left side of the abdomen. My only explanation is that a small portion of sarcomatous tissue may have been attached to the omentum at the time of the original operation. Later, this wandered to the left side of the abdomen, became adherent to the parietal peritoneum and the secondary tumor developed.

Dr. Bell and Dr. McCartney are here tonight and have very kindly consented to discuss some of the pathological aspects of these cases.

RADIATION THERAPY IN TUMORS

R. G. Allison, M.D.†

Minneapolis

X-ray treatment of malignant tumors with voltages in excess of 200 Kv. has now been done over a sufficient length of time to permit some fairly definite conclusions.

1. Unless a tumor is in some degree sensitive to radiation at 200 Kv., no response to radiation at higher voltages can be expected.
2. Tumors which are mildly sensitive to radiation with 200 Kv. can often be permanently cured with treatment at higher voltages.
3. Tumors which are extremely sensitive to radiation at 200 Kv. do not need treatment with higher voltages; in fact, recovery may be retarded owing to the increased damage which results in most cases to the surrounding normal structures from these higher voltages.

Coutard, of the Curie Institute of Paris, has for many years been working with 200 Kv. He has increased the filtration and increased the tube skin distance far above those used by other workers. His system relies on the daily administration of doses of 150 to 300 r and is carried on over a period of from three to six weeks, depending upon the size of the dose the patient can tolerate and the number of fields treated. By this method, doses of 2,000 to 5,000 r, or from three to six erythemas, can be given to each field. The reaction in the skin and surrounding structures, while marked, still permits their return to normal.

Coutard is now working with 400 Kv. and employing the same technic. He feels that in the tumors which are sensitive to radiation at 200 Kv. he has obtained better results at 400 Kv.

This method of treatment was first used by Coutard in the treatment of malignant tumors of the tonsil, larynx, and buccal cavity. This same type of method of treatment is now employed in all deep-seated malignancies as well.

Regardless of the voltage used, this method is now generally employed in the treatment of all malginant growths, occurring anywhere other than on the surface of the body.

The last few years have taught us once more a lesson that we learned years ago with radium; that is, the fact that the limitation of the dose to a given lesion is not the mechanically measured dose, but the capacity of the normal surrounding tissues to recover from the dosage. This factor determines the absolute end point to which any x-ray dose can be carried.

An interesting development that has found considerable favor in Europe is the so-called method of Chaoul, in which a small self-contained generator and x-ray tube are placed in contact with the lesion itself, either directly as in the case of accessible malignancies such as the cervix or skin, or through a surgical approach to the growth. This has been applied especially to lesions of the bowel and kidney after exposure. Such an apparatus is necessarily limited to lower voltages, the top being in the neighborhood of 90 Kv. and with the low filtration and short distances a very rapid delivery of radiation can be effected. The effect is, of course, local and cauterizing and comparable somewhat to contact application of radium except that the time of delivery of an effective dose becomes possible in a few minutes.

In the selection of patients and lesions for treatment there have been few radical changes, but there have been modifications in technic and some crystallization of ideas as to proper treatment.

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†By invitation.

In the female where carcinoma of the breast, uterus and ovaries accounts for the largest portion of malignancy, ideas of technic have become more uniform. Carcinoma of the breast remains primarily a surgical disease with practically all workers agreeing on operation with postoperative radiation. Pfahler and Vastine of Philadelphia, in a large series of cases showing five-year statistics, advise more pre-operative radiation and their figures show definite improvement in five-year cures, where pre-operative and postoperative radiation have been used. They recommend pre-operative radiation especially in cases of Group II where axillary glands are palpable and follow a dosage of 900 r per field to each of three or four fields in two weeks by radical surgery. As soon as primary union is effected (usually in 7 to 14 days), the postoperative series is begun and a similar or larger dose is added as the patient's tolerance permits. In Group III cases they recommend a heavier pre-operative series followed by a six-weeks' wait before operation.

They quote figures from the literature of 28 per cent five-year survivals by operation alone in Group II cases which is increased to 40 per cent by postoperative radiation. In their own series of 400 cases they claim 52 per cent survivals with postoperative radiation and when pre-operative is added, 57 per cent.

A well-advised adjunct to the treatment of carcinoma of the breast in menstruating women is the production of an artificial menopause.

Experimental work in cancer strains of mice has shown a definite decrease in incidence of mammary cancer in castrated females. It seems reasonable to believe that an artificial menopause is of value and the clinical results to date have borne this out.

In the treatment of recurrence and mestasases there has been little or no important progress. It is still apparent though, from the frequent improvement and palliative response, that these patients are entitled to the benefit of a heavy course of radiation to the affected areas.

In the treatment of carcinoma of the cervix, the method advocated by Healy of Memorial Hospital in 1933 has become the predominating one. Here again the fractional method, carried out over a period of approximately four weeks using multiple ports and the intensive dosage possible by such technic, has given improved results. The dosage per field has been carried to from 1,800 to 3,000 r, depending somewhat upon the field choice.

The indications in the different groups remains more or less the same. In the few patients found in Group I with the disease definitely limited to the cervix, radium is the major factor in the treatment with x-ray added to build up the radiation dosage in the adnexa. Groups II and III are by choice first given an intensive dose of x-ray followed immediately by the use of radium. Group IV is treated largely palliatively and for this the high voltage x-ray offers the best medium of attack. With the use of heavier doses some complications such as proctitis with late stricture are being more commonly seen, as well as an atrophic type of vaginitis. With this type of treatment the attempt is made to rely on one series of combined radiation from x-ray and radium, as subsequent series do not have as salubrious a result and are subject to a higher incidence of complications.

In the gastro-intestinal tract x-ray therapy, except in some few instances, does not have much to offer. Attention should again be called to the fact that some carcinomas of the cardiac portion of the stomach are sensitive and do respond to treatment. The treatment of carcinoma of the large bowel is, on the whole, rather disappointing but occasional cases do show definite benefit. The factor of unusual response is well demonstrated by two cases of pseudomyxomatosis peritonei treated by us, in which both patients have been free from symptoms for over two years.

Discussion

Dr. E. T. Bell (by invitation): I know of no cures of carcinoma of the pancreas. One would think that a carcinoma of the tail of the pancreas might be operable occasionally but the usual story is that quite a large tumor has developed before it can be recognized clinically. We have a number of cases on our postmortem records in which there is a long clinical history but a late recognition of the nature of the disease.

Just two days ago we had an interesting postmortem which illustrates some of the difficulties of diagnosis. The patient, with the clinical picture of a carcinoma of the head of the pancreas, was in the hospital. The only discrepancy in the diagnosis of carcinoma was that by Dr. Cecil Watson's test there was some urobilinogen in the stools, more than he would expect in a malignancy. The patient was intensely jaundiced. At exploratory operation the head of the pancreas was found to be hard and the bile duct distended. The patient died and at the postmortem this hard pancreas was found to be an old fibrous pancreatitis. There was an ulcerated stricture in the common bile duct but no carcinoma present. This is very unusual but it illustrates how difficult the diagnosis may sometimes be even at exploratory operation.

We have been impressed in the last two or three years by the frequency of carcinoma in the bile ducts. Over the last two-year periods, carcinoma of the bile duct is more common than carcinoma of the pancreas.

The response to x-ray which Dr. MacKinnon spoke of is something new to me and it offers some encouragement since we have so little to offer these people.

Dr. Dunn's case is very unusual. Dr. McCartney and I have gone over this tumor again and we think it is a lymphosarcoma. It is an enormous tumor, 6 cm. in diameter, spreading out through the tissues. It showed many mitotic figures. There is no escape from the diagnosis, and yet, the patient is apparently well for an interval that is so long that we can almost call it a cure. We have two forms of lymphosarcoma, one of which is a regional tumor and the other a generalized tumor. The regional tumor corresponds with Kundrat's original definition of lymphosarcoma. The generalized form spreads through the lymph nodes all over the body and behaves like Hodgkins disease. This tumor is radiosensitive and the apparent cure is to be attributed to a combination of surgery and radiotherapy. It is a most interesting tumor and only a few cures are recorded in the literature.

I want to mention another case of a lymphosarcoma that I have seen. This patient had a tumor around the vena cava which was palpable through the abdominal wall. Upon exploration a large tumor was found wrapped around the vena cava above the renal arteries.

It was inoperable and only a biopsy was taken. It was a lymphosarcoma. The patient was given radiotherapy; he regained the 20 pounds of weight he had lost, went back to work and was well for nearly one year, after which a recurrence developed which proved fatal. That response to radiotherapy is very encouraging in lymphosarcoma, especially the regional form.

Dr. Peterson's case is also a very rare tumor, an adenocarcinoma of the duodenum. Carcinomas in the small intestine are rather infrequent. A majority of the carcinomas of the small intestine are, fortunately, of the carcinoid type. Carcinoids resemble a basal cell carcinoma of the skin. It is not a benign tumor but it usually produces obstruction early enough for operation and cure. Occasionally it gets out through the lymph nodes and spreads to the liver. Ordinarily this carcinoid produces intestinal obstruction so that an operation has to be done before it is so very far along. It is the most common form of carcinoma of the small intestine. The adenocarcinoma is less frequent and more malignant, and a three-year survival from one of those is quite exceptional.

Dr. Fowler's cases: First, the malignant melanoma. Dr. McCartney and I have reëxamined the microscopic slides and there is no doubt as to its being a malignant melanoma. The one favorable microscopic feature is that it has not penetrated deeply into the tissues. We used to think that none of these tumors were curable. You remember that about perhaps fifteen years ago Dr. Bloodgood reported a series of fifty cases without a five-year survival, and there was quite a lot of pessimism after that report for a long time. However, we have now quite a number of these, perhaps we could count up seven or eight of them in our records, that have gone by the five-year period, so we are not nearly so pessimistic as we used to be in the case of malignant melanoma. We have tried to determine what type of tumor one might hope to cure and what sort of operation would be best. The ones on our record that have survived are apparently those that had small or pedunculated tumors. If a melanoma is out on a pedicle it does not get out into the surrounding tissues so rapidly. I believe that many malignant moles are curable in the early stages.

It is difficult to give correct advice in the handling of moles. We can hardly recommend removal of all benign moles. A short time ago a man about forty years old consulted me. He had a mole on his wrist about 1.5 cm. in diameter which was obviously malignant. He had had that mole for twenty years and during the past eight years he had consulted four different physicians about its removal. Each physician told him to let it alone. In addition to the malignant mole he had about twenty benign moles over his body. Dr. Peyton removed the malignant mole and one of the large benign growths.

About half of these malignant melanomas come from moles that have been present a long time; the other half are moles of recent origin. Those are the ones that are quite disturbing, the moles that first appear in adult life. I am a little bit more uneasy about those than I am about the others. When the mole begins to grow, that is the warning signal but when it begins to grow it is already malignant.

In this connection I want to remind you that there is a benign tumor that looks just like a malignant melanoma, namely, a melanotic papilloma. I have been fooled by these half a dozen times. They will give the same kind of a story, a black mole present for years, and then a recent rapid growth and you are perfectly sure that it is a malignant melanoma. I demonstrated one once to the senior students as a malignant melanoma; upon removal it was found to be a benign papilloma full of melanin.

The first definite signs of malignancy in a mole are an increase in size and a darkening of the skin just around it. The first extension is usually just underneath the epidermis, forming a little bluish halo all around it. When this halo is present the mole is already malignant. A wide excision gives the best chance of removing the extension in the skin. If it has gone to the lymph nodes it is incurable.

A couple of years ago I sent out some follow-up letters, trying to trace patients who had had malignant moles removed. A physician in Fargo called in his patient who had had a mole removed from her cheek ten years previously. To his great surprise a small recurrence was present which proved to be maligant melanoma. I think that we may consider the twelve-year survival in this case as a cure.

The second case of a myxosarcoma is also very encouraging. It is a small tumor but definitely malignant, about Grade II, and there is a twelve-year cure. Often the surgeon is too conservative in the treatment of sarcomas. Only radical treatment offers a chance of cure.

In Dr. Fowler's second case I think that the tumor removed at the first operation is a definite sarcoma. The recurrence appears to be more malignant. In the case of a large tumor there is danger of underestimating its malignancy. Large tumors may contain areas of low malignancy as well as areas of high malignancy. The tumor behaves in accordance with its most malignant portion. This tumor will probably recur.

These fibrosarcomas, especially of the lower degrees of malignancy, have a tendency to come back at intervals. They are cyclic in their behavior. I shall illustrate with a fibrosarcoma of the thoracic wall from our records. The patient has been operated upon four times over a period of sixteen years, about four years between the recurrences. Each time the tumor has the same structure.

Dr. James A. Johnson: Tumors of the small bowel are comparatively rare—so rare in fact that standard textbooks on surgery give them very little consideration. Recently it so happened that I operated upon four cases of tumors of the jejunum, and as a result became interested enough to review the subject.

Carter states that malignant tumors of the jejunum comprise approximately 1 per cent of all those occurring in the gastro-intestinal tract. In June, 1936, there were reported only thirty-one cases of carcinoma of the jejunum in the files of the Mayo Clinic. They further stated that carcinoma of the small bowel represented only .62 per cent of all cancer of the gastro-intestinal tract from the cardiac end of the stomach to the rectum; that cancer of the colon was about eighty times as frequent as in the small intestine. In the University of Minnesota pathological laboratory files we found two cases of cancer of the jejunum in a total of 20,000 complete autopsies in adults.

The operative mortality is apparently high. In 1927 Hellström reported forty-seven cases from the Scandinavian literature with a primary operative mortality of 36.2 per cent. R. Franklin Carter, in the Annals of Surgery, 1935, collected twenty-four cases in which resection was done, with an operative mortality of 43.4 per cent.

I will now show a few slides.

Slide: This shows a percentage distribution of carcinoma in the small bowel. Seventy-two per cent occur within 18 inches of the ligament of Treitz.

Slide: This shows the x-ray of my case of carcinoma of the jejunum. You can easily see the constriction just below the ligament of Treitz. The small proximal stump of the jejunum is very dilated, as is also the stomach. The diagnosis was made preoperatively by Dr. Ude. At operation a constricting carcinoma was found with metastases to lymph nodes. It was a difficult surgical problem because the growth was about 3 inches from the ligament of Treitz and the proximal loop was so dilated and edematous that an end-to-end anastomosis could not be done. I considered doing an anastomosis of the jejunum to the third portion of the duodenum. This was recommended by Carter and appears to be a splendid procedure. I was afraid, however, that I could not safely close the edematous proximal stump of the jejunum. There is much danger of leakage in this locality. I therefore made an end-to-end anastomosis with a large Murphy button, which proved to be very successful. There was an easy postoperative course. The patient is still living two years and three months later, although there is now evidence of recurrence.

The following three slides show the specimen with involved lymphatic glands and microscopic sections.

Slide: This patient presented herself with a movable tumor mass in the left upper abdomen and a severe secondary anemia. At operation the tumor you now see was found—a large semicystic sarcoma. Sarcoma usually arises from the submucous, muscular or subserous coats. This apparently arose from the subserous coat and, as you can see, invaded the muscular layer but did not penetrate into the lumen, but assumed an external growth, which is the usual course. The microscopic section as you see it resembles a neurosarcoma. A resection was done with a side-to-side anastomosis. The postoperative course was uneventful.

Slide: This is a benign adenoma with ulceration. I feared it was malignant because of this ulceration so I resected and did a side-to-side anastomosis. She has remained well to date.

The last case is also an adenoma located high in the jejunum and produced an intussusception which resulted in a gangrenous bowel. A resection was done with a side-to-side anastomosis. The patient has remained entirely well.

We have probably paid too little attention to tumors of the small bowel in the past. It is quite possible that we will be able to diagnose them more often now since x-ray technic of small bowel lesions has recently become more efficient.

I want to congratulate Dr. Peterson on having such an interesting case, and on the result that he obtained with an end-to-end anastomosis in this locality. It certainly demonstrates to me that his technic was carefully executed.

Dr. William Peyton: I came in late and missed the first part of the program so I will have to confine my remarks more or less to the last part.

In the treatment of malignant tumors I have been impressed by the fact that one cannot always depend upon a tumor to act in any predicted manner because it belongs to a certain type and is graded as to degree of malignancy by the pathologist. Regardless of how far one carries out classification there is at times extreme variation in the reaction of individual tumors following surgery or irradiation. This gives one a certain amount of optimism in the treatment of malignancy, since occasionally when a tumor from its general class would be expected to be extremely radioresistant, yet it is to one's surprise found to promptly disappear under treatment, or a tumor seems to be almost impossible of complete removal by surgery, yet freedom from recurrence is of long duration or even permanent. On the contrary, however, one may have every reason, from the nature and extent of the lesion, to expect a favorable result from surgery, only to have prompt recurrence.

Concerning melanoma, I might say that this patient

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with malignant melanoma mentioned by Dr. Bell is still well (tumor removed April, 1937). It was removed under general anesthesia and this point, the use of general anesthesia in tumors that are possibly malignant, I wish to emphasize. It has been my impression for some time that local infiltration anesthesia does occasionally spread malignant tumors. There is evidence from animal experiments to be found in the literature that trauma does cause tumor metastases. Some data that I have collected in experiments on tumor-bearing mice does, I think, definitely confirm the clinical impression that infiltration anesthesia may produce metastases. It does not produce metastases in every case but in a large number of mice with tumors more metastases are found in the lung of the experimented group where the tumor has been removed under local infiltration anesthesia than in the control mice in which all other factors have been the same, but local infiltration anesthesia omitted. No objection is made to regional or distant block anesthesia but only to infiltration of the tissues about the tumor.

The question of when to remove moles is a question which, as Dr. Bell says, is very difficult. I do not know, and I do not think any one knows, when to remove them. My practice is to remove melanomata that are so located that they are apt to be irritated or if otherwise located and they show signs of growth. A mole may become irritated and inflamed and look very much as though it were malignant but you get it out and it is found to be inflammatory and not malignant. I have seen a hemangioma occur in a mole and give it all the appearances of malignant melanoma until we got it out and under the microscope.

In regard to irradiation therapy I want to make a few remarks concerning our own experience and some impressions I have from the literature.

I think that in carcinoma of the breast, irradiation is of distinct value. My impression from the literature is that it improves the five year result by about 10 per cent. Our results in intra-oral carcinomata have been very much improved since we started to use the Coutard, divided dosage, type of therapy. I do not think we have had any favorable results in carcinoma of the stomach or colon following x-ray therapy if one excludes the rectum. Even in the rectum definitely good results have not been numerous. I thought we had a five year cure by irradiation in a case of carcinoma of the rectum presented at a pathological conference, but Dr. Bell, on examination of the tissue from which the diagnosis was made, told us that we did not have carcinoma in the first place. It must have been a diverticulitis. Some of the reported cures of carcinoma of the rectum are no doubt to be accounted for by similar errors in diagnosis.

Dr. J. S. McCartney (by invitation): Dr. Bell, I think, has pretty well discussed the various features of these tumors, but my name had been mentioned so often I ought to defend myself. We run what we sometimes call the Ph.D. and Master's examination among ourselves, when we get a tissue offering particularly difficult diagnosis, the juniors speaking first. Of all the things that come in, it seems to me that lymph nodes and moles give us the greatest trouble in arriving at a satisfactory diagnosis, moles particularly, because they can produce practically any picture that one might ask for, simulating spindle cell sarcoma, round cell sarcoma, individual groups of cells which one might confuse with the cells of a hypernephroma or a nephroma whichever you prefer to call it, alveolar sarcoma, etc. Sometimes we are in a lot of doubt as to just whether a given mole is malignant and whether it is a mole at all.

This particular mole that we have here is certainly quite a superficial one and this feature, as Dr. Bell said, is one of the encouraging features and one reason to think that a cure might be obtained.

I might mention the tumor reported by Dr. Dunn. This really was composed of three nodules, the largest 6 cm. in the maximum diameter, the second about 2 cm. in diameter, and the third, which was definitely a lymph node, 1 cm. in diameter. This lymph node is only partially replaced by this process. The normal structure of the node is completely replaced in the other two masses, the tumor cells are spreading out into the adjacent adipose tissue and, as I said at that time, there is a question of whether it is a lymphosarcoma or perhaps a leukemia, and I suggested an examination of the blood for leukemia. That blood examination was negative. It is very difficult at times to make a differentiation on a single section of a node as to whether it is lymphosarcoma or a leukemic type of change.

This myxosarcoma is a tumor that I would be very decidedly afraid of. It is a tumor that might metastasize and, although we do not ordinarily expect regional node involvement with sarcomas, occasionally that does happen. We have seen one or two instances where osteogenic sarcomas of bone have metastasized to regional nodes. The same thing applies to other sarcomas. Of course, one feature we don't like in this particular tumor is the myxomatous feature. A myxoma is always a worse tumor than is an ordinary connective tissue tumor of about the same degree of differentiation.

There might be some question in Dr. Fowler's case as to the justification of the name "spindle cell sarcoma." I made that last Spring and in looking at the section again yesterday it is a question whether that diagnosis is really justified, and whether it should not be called a fibrosarcoma of perhaps grade II or thereabouts.

Dr. L. H. Fowler: I wish to thank the gentlemen for their very kind discussions. I might ask Dr. Allison if the spindle cell or fibrosarcoma are susceptible to x-ray therapy at all.

Dr. R. G. Allison: In answer to Dr. Fowler's question, I think they are less susceptible than other types of malignancy. In fact, we have been unable to make any impression on them at all with 200 Kv. I think they are less susceptible than any other type.

BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

BOOKS RECEIVED FOR REVIEW

Clinical Gastroenterology. Horace Weldell Soper, M.D., F.A.C.P. of St. Louis, Missouri. 314 pages. Illus. Price, cloth, $6.00. St. Louis: C. V. Mosby Co, 1939.

The Vaginal Diaphragm. Le Mon Clark, M.S., M.D., of Chicago, Ill. 107 pages. Illus. Price, cloth, $2.00. St. Louis: C. V. Mosby Co., 1939.

Your Chest Should Be Flat. S. A. Weisman, M.D., F.A.C.P. Assistant Professor of Medicine, University of Minnesota; Member of Consulting Staff, Glen Lake Sanatorium, Oak Terrace, Minnesota; Member of Staff of St. Andrew's and St. Mary's Hospitals, Minneapolis, Minnesota. 145 pages. Illus. Price, cloth, $2.00. Philadelphia: J. B. Lippincott & Co., 1939.

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CORONARY THROMBOSIS AMONG PERSONS LESS THAN FORTY YEARS OF AGE*

A Study of Thirty Cases

WILLIAM H. GOODSON, JR., M.D., and FREDRICK A. WILLIUS, M.D.

Rochester, Minnesota

ONE of the alarming problems of present-day medicine is the increasing incidence of coronary thrombosis and its more frequent occurrence in the younger age periods of life. The first description of the disease with correct clinical diagnosis in this country is found in Herrick's classical article of 1912. In the article he cited two cases in which the patients were young persons, one a man thirty-two years of age, the case reported by Chiari, and the other a man thirty-seven years of age, the case reported by Merkel.

Our interest in the occurrence of coronary thrombosis of young patients involves the broader concepts of coronary sclerosis and atherosclerosis and this study was undertaken to investigate various clues with special reference to the genesis of the disease.

Material

Thirty cases of unquestioned coronary thrombosis comprised the basis for this study. The criteria on which the cases were selected included (1) typical histories of the disease given by patients who had experienced attacks before they came under our observation and who had electrocardiographic relics, and (2) typical clinical phenomena discovered in examination of patients who suffered thrombotic closure while under observation at The Mayo Clinic, confirmed by characteristic electrocardiographic changes or verification at necropsy.

Incidence by Age and Sex

All but three patients were recorded as being between the ages of thirty and thirty-nine years. One of these patients was twenty-two years of age and the other two were twenty-nine. The average age for the group, exclusive of the three patients who were less than thirty years of age, was 34.7, while that for the males was 34.7 years and for the females 34.6 years.

However, the occurrence of coronary thrombosis somewhat later in the lives of women than of men has been emphasized by Willius in a series of 370 cases.

There were twenty-four males and six females, a ratio of 4:1. This is in line with all previously reported studies of the sex incidence of coronary thrombosis. The sex discrepancy of coronary disease is one of the most intriguing problems of the many that remain unsolved and, as intimated in a previous study,[1] may ultimately be answered by studies in biochemistry.

Racial Trends

The number of cases in this group was not sufficiently large to permit the derivation of reliable racial trends. Sixteen patients were of American parentage while the remaining patients were fairly equally divided among seven foreign ancestries.

Hereditary Trends

The occurrence of coronary disease among patients whose family histories reveal the repetition of cardiovascular disease among their ancestors has repeatedly been the basis for comment. In a recent study of 300 cases of coronary thrombosis, Goldsmith and Willius showed that a family history of cardiovascular renal disease occurred in 55 per cent of the cases. In this study, 65 per cent of the patients related family histories which included angina pectoris, coronary thrombosis, sudden death, or "heart disease." The hereditary trend in this study closely paralleled that referred to in the previous report.

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*From The Mayo Foundation (Goodson) and the Section on Cardiology (Willius), The Mayo Clinic, Rochester, Minnesota.

The previous illnesses experienced by these patients were in no sense unusual but represented the usual infectious diseases of childhood and adolescence and could in no manner be related to the premature development of coronary disease. In three cases the history of previous rheumatic fever was elicited but in no instances were relics of cardiac disease demonstrated and it appeared improbable that the coronary changes were associated with antecedent rheumatic coronary arteritis.

Use of Tobacco

Concerning twenty-six of the patients, the history of the use of tobacco was recorded. Nineteen (73 per cent) smoked cigarettes; nine smoked excessively and ten moderately; seven did not smoke. None of the women were recorded as smokers. As these figures are not controlled they are only of passing interest, but this subject is under investigation at present on a much broader scale.

Other Clinical Data

In eight cases the anginal syndrome preceded acute coronary closure by an interval of from one day to six months. The average interval was a month and a half. In the remaining twenty-two cases, coronary thrombosis was the first expression of the disease.

Three patients were engaged in strenuous work when the arterial closure occurred, eight were participating in moderate activity, four had just completed a meal, three had just awakened from sleep, while the status of activity of the remaining twelve patients was not determined.

In three cases the attack was without pain; one patient experienced severe nausea, another a feeling of suffocation, and the last a sense of distention. In the other cases the conventional phenomena of the disease were present.

Electrocardiographic Findings

Electrocardiographic examination was conducted in twenty-nine cases. The patient who was not subjected to this examination was under observation at The Mayo Clinic only a short time before death occurred, but postmortem study revealed acute infarcts. Owing to certain unusual features, the case of this twenty-two-year-old woman will be detailed later.

The electrocardiograms of twenty-four patients clearly verified the clinical diagnosis of coronary thrombosis. In five cases, electrocardiograms that were made a considerable time after the occlusion were essentially normal.

The infarcts, as indicated by the electrocardiographic patterns,[2] were in the anterior wall of the left ventricle in nine cases. Eight of the electrocardiograms were of the T_1 pattern while one was of the Q_1T_1 pattern. In fifteen cases the infarcts were in the posterior basal portion of the left ventricle, the region customarily supplied by branches of the right coronary artery. The patterns were of the T_3 type in nine cases, of the Q_3 type in two cases, and of the Q_3T_3 type in four cases.

The incidence of infarcts of the posterior basal region of the left ventricle in this group greatly exceeds that previously reported and may be a wholly coincidental occurrence.

Mortality

At the time of conclusion of this study eight patients (26.6 per cent) were known to be dead and their average period of survival following the first thrombotic occlusion was twenty-two months. Two died the day of the second occlusion. Ten (28 per cent) of the patients ultimately had two attacks of coronary thrombosis ranging from one month to six years following the first. In one case in this series, previously reported by Smith and Bartels, there were at least four infarcts; the conglomerate involvement of the myocardium made accurate delineation impossible, although the anterior right coronary artery was completely occluded at two points, the anterior descending branch of the left coronary artery at one point and an anomalous left circumflex artery at two points.

Postmortem examination was conducted in five cases, which included four males and one female.

The first case, that of a man thirty-five years of age at death, already has been mentioned.

The heart weighed 715 gm. and was the site of multiple infarcts. In the coronary arteries, evidence was found of atherosclerosis, grade 3. The second case was that of a man, thirty-six years of age at death. A huge, acute infarct involved the apex of the left ventricle. The anterior descending branch of the left coronary artery was completely obstructed by a fresh thrombus. The heart weighed 540 gm. Atherosclerosis, grade 3, of the coronary arteries, was present.

In the third case the patient was a man who died, aged thirty-seven years. An extensive, healed infarct of the left ventricle near the apex was found. Considerable myofibrosis of the left ventricle was present. The heart weighed 450 gm. Atherosclerosis, grade 2+, of the coronary arteries was present.

The patient in the fourth case, a man, died at the age of thirty-eight years. Postmortem examination revealed an acute infarct of the left ventricle corresponding to the distribution of the anterior descending branch of the left coronary artery. Also, there was a healed infarct involving the posterior basal region of the left ventricle and resulting from a previous thrombotic occlusion of the right circumflex artery. The heart weighed 457 gm. Examination of the coronary arteries disclosed atherosclerosis, grade 2.

The fifth case merits special consideration owing to certain unusual circumstances and owing to its similarity to a case reported by White, Glendy and Gustafson. The patient, a woman, twenty-two years of age, was in the third month of her first pregnancy when death occurred. The onset of her fatal illness coincided with a fall from a low porch, at which time a head injury was sustained. She was found on the ground unconscious and did not regain consciousness before her death, sixteen hours later. In view of the postmortem findings it could not be ascertained whether the fall was occasioned by the severe pain of coronary thrombosis or whether coronary thrombosis occurred as a consequence of a head injury resulting in shock and unconsciousness. There was an acute infarct of the posterior wall of the right ventricle and likewise a linear infarct in the central portion of the interventricular septum, extending from the base to the apex. The heart weighed 282 gm. and there was no atherosclerosis of the coronary arteries. Examination of the brain disclosed petechial hemorrhages in the cortex of the right frontoparietal region.

Comment

The report of these cases of coronary thrombosis of young persons is justified in again emphasizing the fact that this disease is occurring with increasing frequency among young persons. Likewise, it is intended to recall to mind the fact that an alert suspicion regarding its occurrence among young people must be maintained. The general phenomena of coronary thrombosis of the young do not differ materially from those of the same condition when it affects older persons.

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LATE RESULTS OF THORACOPLASTY*

HERBERT A. CARLSON, M.D., HERBERT A. BURNS, M.D., and
OWEN H. WANGENSTEEN, M.D.

Minneapolis, Minnesota

ANY attempt to evaluate thoracoplasty as a therapeutic measure for pulmonary tuberculosis must be based upon recognition of the fact that thoracoplasty patients constitute a limited and select group. Only a comprehensive survey of the fate of a large, unselected series of tuberculous patients treated by diverse medical and surgical means serves to place the operation of thoracoplasty in its true perspective. Data now being collected at the Minnesota State Sanatorium will soon permit an analysis of the results of treatment of all patients admitted to the Sanatorium. In that study, however, reference to the thoracoplasty series will necessarily be so brief that we wish, at this time, to report in more detail follow-up data pertaining to fifty patients subjected to thoracoplasty prior to January 1, 1937.

All of the patients in this series originally admitted to the Minnesota State Sanatorium were operated on at the University of Minnesota Hospital over a period of eleven years (1926 to 1936, inclusive). Patients operated on for tuberculous empyema were excluded. The fifty thoracoplasties were performed in multiple stages totaling one hundred and thirty-one primary thoracoplasty operations. Subsequently five of the patients required revision of thoracoplasty performed in eight stages. The fifty patients, therefore, were subjected to a total of one hundred and thirty-nine thoracic operations. As some State Sanatorium patients have been operated upon elsewhere and as the University Hospital admits patients from other Sanatoria, the series obviously represents only a fraction of the thoracoplasty experience of the two institutions, but it seemed best to restrict the study to those who had had the same institutional care in order to present a more uniform series and to avoid duplicating follow-up studies that may be reported elsewhere.

Analysis of Material

All of the patients but two were of the white race, one being Chinese, the other part white and part Chippewa Indian. The ages at the time of operation varied from seventeen to fifty years. As nineteen (38 per cent) were past thirty-five years and nine (18 per cent) past forty years, patients regarded as "old for thoracoplasty" were well represented. Women outnumbered the men 31 (62 per cent) to 19 (38 per cent).

It is hardly possible to present an adequate picture of the extent and character of the pulmonary disease of this group of patients by means of any system of classification. All were classified as far-advanced. Productive lesions were the rule, but in about 10 per cent of the cases the disease was predominantly exudative. All had cavitation. In twenty-six (52 per cent) the disease was essentially unilateral, in twenty-two (44 per cent) bilateral with unilateral cavitation, and in one (2 per cent) bilateral with definite bilateral cavitation.* Measurement of cavities on the x-ray film revealed that in twelve (24 per cent) the cavity measured 2 cm. or less in diameter, twenty-four (48 per cent) measured 2 to 5 cm., and thirteen (26 per cent) more than 5 cm.* Lesions of the left side predominated, the more extensive lesion occurring on the left in thirty-one (62 per cent).

Definite shift of the mediastinum to the affected side occurred in thirty (60 per cent). Dense shadows with mediastinal retraction indicating atelectasis or extensive lung fibrosis occurred in twenty-three (46 per cent). Bronchiectasis was demonstrated by bronchography in only six (12 per cent) but as the earlier patients did not have lipiodol aspirations the actual incidence of dilated bronchi was undoubtedly greater. Other associated thoracic conditions were as follows: pneumothorax three (6 per cent), pleural effusion two (4 per cent), oleothorax one (2 per cent), calcification of pleura one (2 per cent).

Technic of Thoracoplasty

Since 1926 when the first thoracoplasty in this series was performed, the technic of operation has undergone a gradual evolution. From 1926

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*From the Minnesota State Sanatorium and the Department of Surgery, University of Minnesota.

*One patient not classified.

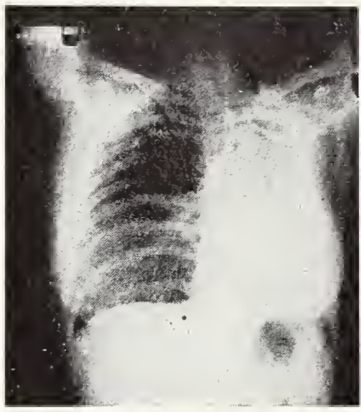
through 1930 the operation usually consisted of a paravertebral resection of eleven ribs, performed in two stages (Fig. 1). Only two of the fourteen patients operated on during that period had resection of less than ten ribs. The lower stage operation was performed first in three cases. All others had the upper stage performed first. This stage consisted of resection of five or six or even seven ribs. The segment of rib removed was seldom longer than 12 cm. and the resection of the first rib in some instances was limited to the removal of as little as 1 cm. of rib.

From 1931 through 1933 the operation was modified in that longer rib segments were removed. Six of the sixteen patients operated on during this period had antero-lateral thoracoplasty performed as the final stage. Only five patients among the sixteen had resections of less than ten ribs.

Beginning in 1934 a further modification of the technic of thoracoplasty was introduced at the University Hospital by O. H. Wangensteen. This modification consisted of performing an anterior chondrocostectomy as a preliminary stage. A week or two later total resection of the upper three ribs was performed through a posterior incision. A second posterior operation consisted of resection of two or three or four more ribs. The resulting thoracoplasty involving five to seven ribs and including complete removal of the upper three or more ribs and costal cartilages was often found to be adequate but if necessary an additional stage was performed to include resection as low as the ninth or tenth rib (Fig. 2).

During the period 1934 through 1936, fifteen of twenty patients had resection of less than ten ribs and ten patients had resection of less than eight ribs. Attention was also directed toward further shortening the posterior segment, the rib being divided under the transverse process or the transverse process itself being resected with the rib close to the body of the vertebra. It was during this period also that the extrafascial apicolysis of Semb was popularized but only three of the patients referred to here were subjected to extrafascial apicolysis. A more complete description of the technic developed during the years 1934 to 1936 is reported elsewhere by Wangensteen, Carlson and Bowers.

The anesthetic employed in most instances was nitrous oxide or ethylene, although cyclo-propane is now preferred. Novocaine infiltration was used occasionally but was regarded as less satisfactory than modern inhalation anesthesia.



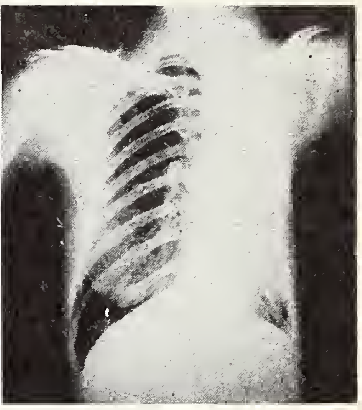


Fig. 1 *(left)*. Example of paravertebral thoracoplasty performed in two stages in 1928. Eleven ribs were resected but collapse is unsatisfactory because only short paravertebral rib segments were resected. The patient is still alive ten years after operation but sputum is positive, cavity open.

Fig. 2 *(right)*. Example of thoracoplasty performed in four stages in 1935. The upper four ribs and costal cartilages were completely removed and six additional ribs were resected. Anatomical collapse is much superior to that shown in Figure 1. The patient is alive, practically without symptoms, sputum is negative, cavity closed.

Late Results

In our study of the late results of thoracoplasty, information was obtained from sanatorium records, x-ray examination, bacteriological study of the sputum, and also by questionnaires sent to patients and physicians. Chief reliance is placed upon recent x-ray and sputum examinations. In this connection it must be obvious that the manner in which data are collected is fully as important as the tabulated statistics. Such terms as "positive" or "negative" sputum are meaningless unless one first establishes a definition of negative sputum based upon definite, rigid criteria. The question of whether a cavity is "open" or "closed" on x-ray examination is also subject to wide interpretation. Negative sputum, as defined here, denotes that guinea pig inoculation of sputum has been reported negative following a succession of negative monthly flotation tests over a period of not less than six months and that subsequently during the patient's residence in the sanatorium or after discharge to his home over a period of months or years the sputum has consistently remained negative.

X-ray interpretation in recent years has been more accurate than formerly due largely to the more frequent employment of special technic,

TABLE I. RESULTS OF THORACOPLASTY
(Status of sputum and cavity in 1938)

		Year of Operation			Totals
		1926-1930	1931-1933	1934-1936	1926-1936
Living	Cavity closed and sputum negative	5 (36%)	9 (56%)	11 (55%)	25 (50%)
	Status of sputum or cavity doubtful	2 (14%)	2 (12%)	4 (20%)	8 (16%)
	Cavity open or sputum positive	2 (14%)	1 (6%)	2 (10%)	5 (10%)
Dead		5 (36%)	4 (25%)	3 (15%)	12 (24%)
Total number in each period		14	16	20	50

TABLE II. INFLUENCE OF SIZE OF CAVITY ON RESULT
(Status of sputum and cavity)

		Size of Cavities			
		0-2 cm.	2-5 cm.	More than 5 cm.	Totals
Living	Cavity closed and sputum negative	10 (83%)	10 (41%)	5 (38%)	25 (50%)
	Status of sputum or cavity doubtful	0	7 (30%)	1 (8%)	8 (16%)
	Cavity open or sputum positive	0	3 (12%)	2 (15%)	5 (10%)
Dead*		2 (17%)	4 (17%)	5 (38%)	12 (24%)*
Totals		12	24	13	50

*One patient not classified—Films not found.

such as increased penetration, Bucky diaphragm, stereoscopic, lateral or oblique films, or the introduction of lipiodol. Despite these advances the roentgen film does not give infallible evidence concerning the fate of pulmonary lesions that have been collapsed by thoracoplasty. In presenting our data, therefore, it seemed best to combine the evidence obtained from both x-ray and sputum examinations (Table I). Comparison of the data in three successive periods (Table I) suggests that improved results have been obtained in recent years although the most recent period (1934-1936) contains the greatest number of patients in which the results of treatment are not clearly determined. One recent patient, for example, is classified among the doubtful results merely because of a recent positive guinea pig report despite the fact that the sputum has repeatedly been negative on flotation tests.

X-ray films permit us to compare the degree of collapse obtained by the modern thoracoplasty as compared with that performed earlier. Films of patients operated on during the years 1926 to 1930 reveal that only a partial collapse of the thoracic cage was attained, a collapse which we now consider inadequate (Fig. 1). During the years 1931 to 1933 the collapse was more satisfactory but in many instances still inadequate. Since 1934 the collapse of the upper portion of the thoracic cage has almost invariably been good (Fig. 2). Comparison of films of these three different periods reveal quite clearly that failure to obtain the desired clinical result in some of the earlier cases was, without doubt, due to the incomplete removal of segments of ribs in the region of pulmonary cavities.

The x-ray films also provide an interesting record of changes occurring on the unoperated side. In three instances (6 per cent) the contralateral lung was worse after operation, in thirty-eight (76 per cent) it remained practically unchanged and in eight (16 per cent) it showed definite improvement.*

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*One not classified.

The results of thoracoplasty are not determined entirely by the type of operation but are influenced primarily by certain characteristics of the pulmonary disease such as the size of cavities, thickness of cavity walls, bronchial stenosis, bronchiectasis, thickened pleura, et cetera. Evidence presented in Table II supports the belief that the size of the cavity is important, as cavities measuring 2 cm. or less were closed about twice as frequently as those measuring more than 5 cm.

Health of Surviving Patients

Answers to questionnaires from patients and physicians reveal that of the thirty-eight survivors all but one report clinical improvement and three are entirely symptom-free. Seventeen are known to be working full time or part time, eleven are living at home but are unemployed, three failed to report whether they were working, and seven are still in the sanatorium.

Six of the seven patients who still reside in the sanatorium are ambulant or semi-ambulant; one, as a consequence of a mixed tuberculous empyema, must remain in bed. One patient of this group has a negative sputum and is about ready for discharge, the sputum of another is positive only on guinea pig inoculation but in this case the presence of a slit-like cavity has been demonstrated by x-ray. The other five patients have positive sputum on flotation. One of the latter has a tuberculous laryngitis.

Further surgery has been recommended for three of the patients now residing in the sanatorium. Additional surgery is definitely contraindicated in the case of the patient with empyema referred to above because of extensive pulmonary disease.

Mortality

It will be noted (Table I) that twelve (24 per cent) of the patients are now dead, eighteen months to twelve years after operation. This tabulation includes deaths from all causes and, obviously, should not be considered as a report of operative mortality. Only one post-operative death occurred among the fifty primary thoracoplasties performed in 131 stages. The case operative mortality, therefore, is 2 per cent; the stage operative mortality is 0.7 per cent. All other deaths occurred from six months to thirty-nine months after operation.

One of the late deaths was also due to operation as it occurred following a revision operation performed one year after the patient had survived the original three-stage thoracoplasty, including an extrafascial apicolysis. This patient was one of five who had revision of thoracoplasty performed in eight stages. The case mortality for revision of thoracoplasty in this small series, therefore, was 20 per cent.

Ten deaths remain to be explained. Six are *known* and two others are *believed* to have been due to progress of the tuberculosis. One patient who had a negative sputum and a closed cavity on x-ray examination died of glomerulonephritis (no necropsy); one who at necropsy was found to have quiescent pulmonary disease (cavity closed by thoracoplasty) died of cardiac disease three years after thoracoplasty.

Comment

The late results reported here appear to be somewhat better than the collected statistics of Hedblom and Van Hazel, which include the experience of Bull, Key, Schedtler, Denk and others. They found that "among 3,762 patients followed for from one to twelve years after operation 35.3 per cent were free from symptoms and bacilli and were able to work; 22.1 per cent were improved and able to do some work; 5.5 per cent were not improved or were made worse by the operation; 3.5 per cent were not traced; 33.6 per cent were dead at the time of the report." On the other hand our data are not so encouraging as the more recent statistics of Haight and Alexander, who have reported on the results of the *modern* type of thoracoplasty performed upon 119 patients with cavernous pulmonary tuberculosis and positive sputum, with or without empyema, from the latter part of 1932 to the end of 1934. "Ninety-nine or 83.1 per cent of these patients have completely closed cavities and persistently negative sputum." However, direct comparison of these statistics is hardly possible. It suffices for our purposes to present the data pertaining to our particular group of patients and to stress the fact that tabulated results depend fully as much on the selection of patients for operation, the time that has elapsed since operation and the criteria for "negative sputum" and "closure of cavity" as on surgical methods.

The number of patients that have returned to work is not regarded by us as an accurate test of the success of thoracoplasty. Whether a patient works or not depends upon a number of conditions or attributes not necessarily related to physical health, such as ambition, confidence, capacity to become rehabilitated, and opportunities for employment. Some patients are known to have sought and found employment when their physical condition or sputum status contraindicated it; others, who appeared to be capable of working, remain idle.

Summary and Conclusions

1. A survey of the fate of fifty thoracoplasty patients eighteen months to twelve years after operation reveals that 76 per cent are living, 24 per cent are dead.
2. The primary case operative mortality was 2 per cent; the stage operative mortality 0.7 per cent.
3. One-half of the patients (50 per cent of the entire group) have both closed cavities on x-ray examination and negative sputum, including guinea pig inoculation.
4. Comparison of x-rays of three different periods (1926-1930), (1931-1933), (1934-1936) demonstrates that improved collapse has been obtained by modification of the technic of thoracoplasty.
5. The results of thoracoplasty are determined primarily by the pathologic characteristics of the pulmonary disease of patients selected for operation.

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PRIMARY CARCINOMA OF THE PANCREAS*

JUSTUS OHAGE, M.D.

Saint Paul, Minnesota

PRIMARY carcinoma of the pancreas presents a painstaking but not insuperable diagnostic problem. We have reviewed thirty-nine cases recorded at the Ancker Hospital, Saint Paul, since 1925 and find that correct preoperative diagnoses were entered in at least fifteen cases (38 per cent). Though no biopsies of pancreatic tumors were made at the time of operation, all cases were proved by autopsy (thirty-four) or by operation (five).

The diagnosis is largely by exclusion. Most commonly, cancer of the head of the pancreas must be differentiated from stone in the common duct. For this purpose, the Watson test is very helpful. It should also be noted that, contrary to the usual teaching, jaundice is not a cardinal symptom of cancer of the head of the pancreas. It was not present in at least four and probably seven of the thirty-nine cases reviewed. X-ray examination of the stomach and duodenum, with negative findings except for the possible presence of an extrinsic mass, is also a very valuable procedure in establishing a diagnosis of primary carcinoma of the pancreas.

Incidence

Cancer of the pancreas is not a rare disease. Primary carcinoma of the pancreas represented 4.8 per cent of all carcinoma cases in Massachusetts hospitals from 1928 to 1930, a survey by Howard M. Clute showed. Lewis reported an incidence of from 1.5 to 2 per cent; Hoffmann reported 3 per cent; N. Logan Leven reported from 1 to 2 per cent; F. W. Herrmann reported from 1.5 to 2 per cent. Our thirty-nine cases represent an incidence of 1.4 per cent of all the cases of carcinoma recorded at the Ancker Hospital since 1925.

Cancer of the pancreas was more common among males than among females, in the ratio of 2.5 to 1. There were 27 males and 12 females in the series. The disease is most common in the fifth and sixth decades. The average age of the patients in this series at the time of admission to the hospital was sixty-one years; the oldest, eighty-three, the youngest, twenty-seven. However, one case has been reported in a child two and a half years of age, and another in a newborn infant.

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Tumors of the pancreas seem to be overwhelmingly carcinomatous. In reviewing 132 cases of tumors of the pancreas, Lewis found 127 to be carcinoma, two sarcoma, two cysts, and one a syphiloma.

Etiology

Exact knowledge as to the etiology of carcinoma of the pancreas is no further advanced than knowledge of cancer elsewhere in the body. Among the factors suggested as leading to the development of carcinoma of the pancreas are: (1) chronic pancreatitis, (2) gallstones, (3) cholecystitis, (4) alcoholism, (5) trauma, (6) developmental defects, and (7) syphilis.

Since only one case of syphilis (positive Wassermann) was recorded among the thirty-nine cases which we reviewed, it seems rather doubtful that syphilis need be considered an important etiologic factor in the development of carcinoma of the pancreas.

The carcinoma may be: (1) scirrhous, (2) medullary, or (3) gelatinous. It may originate from: (1) the epithelial cells of the ducts; (2) the parenchyma of the gland; or (3) very rarely, from the islands of Langerhans. Walters says that 20 per cent of the tumors of the pancreas are inflammatory.

In the thirty-four cases of primary carcinoma which came to autopsy, only the head of the pancreas was involved in twenty-three, which is almost 60 per cent. The body of the pancreas was involved in five, the tail in three, the entire gland in three.

Diagnosis and Symptomatology.—The textbooks teach that epigastric pains and jaundice are among the cardinal symptoms of carcinoma of the pancreas. Osler states that the points of greatest importance in the diagnosis are intense and permanent jaundice with dilatation of the gallbladder, rapid emaciation and a tumor in the epigastric region. Rose and Carless state: "The condition is not necessarily painful in the early stages . . . as it develops it becomes more painful and the patient wastes away and loses appetite and energy. Jaundice gradually supervenes and becomes absolute, with an enlarged gallbladder."

Our observations run somewhat counter to these teachings. It is true that thrity-seven of our thirty-nine cases had epigastric pain, radiating to the back and varying from mild to severe colicky pains. In most cases, however, the pain was mild and did not require sedatives. There was a sensation of fullness and epigastric distress, especially after nourishment.

As for jaundice, it was by no means a constant finding. It was positively reported in only twenty-four of our thirty-nine cases. In four of the patients who did not show jaundice, autopsy revealed that there was no involvement of the common duct either by extension of malignant growth or by compression. In one case, an anatomical anomaly, the common duct passed completely over the head of the pancreas without penetrating it. Lake and Marshall state that developmental abnormalities of the pancreas are not uncommon. Obviously, if the development of carcinoma in the head of the pancreas fails to involve the common duct, jaundice will not occur.

The most common findings in carcinoma of the pancreas were weakness and loss of weight, suffered by all thirty-nine patients in our series. The average weight loss was twenty-eight pounds.

The average duration of symptoms was three months; longest, eight years, shortest, two weeks. Nausea and vomiting occurred in twenty-eight of the thirty-nine cases. In nineteen cases there was a palpable mass; in twenty-two, liver enlargement; in ten, gallstones. Urinalysis was negative in thirty cases, but seven patients had nephritis. There were only two cases of diabetes, lasting from three to five years. We feel that there is no relation between carcinoma of the pancreas and either diabetes or hyperinsulinism.

Ten of our patients exhibited the Bard-Pick syndrome, i.e., progressive jaundice with no remissions, distention of the gallbladder, absence of hepatic enlargement, subnormal temperature and rapid cachexia and emaciation. All cases showed a secondary anemia due to nutritional disturbance. Stool analysis in five cases showed an absence of bile and presence of occult blood. In one case, the presence of undigested food in the stool was owing to a fistula between the jejunum and the transverse colon.

MARYLAND

Differential Diagnosis

Since the diagnosis of primary carcinoma of the pancreas is largely by exclusion, the differential diagnosis assumes considerable importance. This condition is most apt to be confused with stone in the common duct. However, we have a rather reliable test, the Watson test, for ruling out the stone in the common duct. With stone, a little bile always enters the intestinal tract; more, in fact, than when the symptom of jaundice is due to neoplasm in the biliary passages. The outflow of bile can be measured by urobilinogen estimation. In cases of jaundice due to stone in the common duct, Watson has reported, the amount of urobilinogen in the feces is in no instance less than 10 mgm. per day, and usually more. Hence, if the Watson test reveals more than 10 mgm. of urobilinogen, in a suspected case of carcinoma of the pancreas, we can, with some certainty, rule out the possibility of carcinoma. At Ancker Hospital, the Watson test has proved accurate in more than 90 per cent of twenty-eight cases of biliary obstruction.

Another diagnostic point in ruling out stone in the common duct is that the patients with stone generally suffer more acute pain.

Other conditions from which primary carcinoma of the pancreas must usually be differentiated are: (1) benign stricture of the common duct; (2) carcinoma of the gallbladder or bile duct; (3) carcinoma of the duodenum and ampulla of Vater; (4) chronic pancreatitis with sclerosis of the gland; (5) biliary cirrhosis; and (6) acute catarrhal jaundice.

The differentiating points are as follows:

In benign stricture of the common duct, we usually get a history of some operative procedure in this region and the symptoms are of longer duration.

Chronic pancreatitis, with sclerosis of the gland, is also generally of longer duration. It is more common in females, and may produce a fever instead of the subnormal temperature common with carcinoma of the pancreas. Acute catarrhal jaundice may also produce chills and fever. It usually occurs in younger people.

Biliary cirrhosis is commonly a more chronic ailment than primary carcinoma of the pancreas.

With carcinoma of the gallbladder or bile ducts, complete blocking of the bile flow usually occurs, and probably earlier. With carcinoma of the duodenum and ampulla of Vater, x-ray examination may be helpful. However, all the carcinomas in sites adjacent to the pancreas are exceedingly difficult to differentiate.

Some help may be had by applying Courvoisier's law when considering patients with jaundice: If the gallbladder is distended, carcinoma of the pancreas or common duct is the cause. If the gallbladder is contracted, it is due to stone in the common duct. Lewis states that Courvoisier's law is correct in about 80 per cent of the cases.

X-ray Examinations

Negative findings in the stomach and duodenum are exceedingly valuable in excluding these organs as sites of the cancer process. Of our thirty-nine cases, however, only seventeen were submitted to x-ray examination. In five cases there was an extrinsic stomach mass; in two, a cascade stomach; in one, a jejunal colic fistula; and in one, a widening of the duodenal ring due to an extrinsic mass.

Discussing the x-ray findings in carcinoma of the pancreas, W. H. Dixon states that carcinoma of the pancreas can often be diagnosed by observing the pressure of an extrinsic mass on the duodenum, pylorus or cardiac and of the stomach. Harrison states that carcinoma of the head of the pancreas causes stenosis or narrowing and displacement of the duodenum and an increase of the duodenal loop. Tumors of the pancreas have been visualized by means of pneumoperitoneum and lateral pictures.

Prognosis

The prognosis in primary carcinoma of the pancreas is exceedingly grave. However, it is not absolutely hopeless. We can report one patient, who underwent cholecystograstrostomy, who is alive and well four years after the operation.

Walters states that 15 per cent of 113 patients with tumor in the region of the head of the pancreas causing biliary obstruction were alive three years after operation. W. J. Mayo records the case of an old lady who lived six years after cholecystogastrostomy for biliary obstruction due to a mass at the head of the pancreas.

Most surgery for carcinoma of the pancreas, however, must be considered frankly palliative or exploratory. Moynihan said that all cases of obstructive jaundice are entitled to an exploratory laparotomy. Lewis has further pointed out that in all operations on the gallbladder and bile ducts, the pancreas should be palpated, for the reason that if there is any suspicion of carcinoma of the pancreas, the gallbladder should not be removed. Presence of the gallbladder is one of the most important palliative factors in the treatment of carcinoma of the pancreas. In Lewis's cases the average duration of life after operation was from six to eight months, but during this period the patients were free from their previously marked jaundice and pruritus.

With carcinoma of the pancreas, metastasis takes place early by direct extension to: (1) the tissues adjacent to the pancreas; (2) to the regional lymph nodes; and (3) through the blood stream.

Of the thirty-four cases in our series which came to autopsy, twenty showed metastases to the liver, eighteen to the regional lymph nodes, twelve to the peritoneum, one to the gallbladder, four to the adrenals, two to the stomach, one to the kidney, one to the spleen, five to the small intestine, and one to the thyroid.

Treatment

Though x-ray and radium are sometimes beneficial, surgical intervention is generally the best palliative means. Cholecystoduodenostomy and cholecystojejunostomy are the operations of choice. Lahey recommends cholecystojejunostomy.

In addition to cholecystogastrostomy, the other possible operations are cholecystoenterostomy, cholecystostomy, and radical excision. Three cases have been reported in which the pancreas was completely removed without intervention of diabetes. However, in these three cases recurrence and death occurred within six months. Cholecystostomy is inadvisable because of the loss of bile needed for emulsifying fats. This bile loss prompts a more rapid decline of the patient. With cholecystocolostomy, there is the danger of a rapidly ascending infection of the gallbladder and bile ducts.

The best incision for complete exploration of the pancreas is a transverse incision above the umbilicus, cutting both recti muscles. The gastrocolic omentum is divided, thus exposing the entire gland.

Sauve and Desjardins developed a technic for partial and total pancreatectomy. The operation consists of: (1) anastomosis of the gallbladder or common duct to the stomach; (2) gastroenterostomy; (3) resection of the head of the pancreas and duodenum; (4) implantation of the remainder of the pancreas into the jejunum.

Operations were performed on nineteen of the thirty-nine cases in our series as follows: exploratory laparotomy, 5; cholecystogastrostomy, 4; cholecystostomy, 3; cholecystectomy, 1; cholecystoduodenostomy, 3; choledochotomy, 1; cholecystocolostomy, 1; posterior gastroenterostomy for duodenal obstruction due to large pancreatic mass, 1.

Summary and Conclusions

A series of thirty-nine cases of primary carcinoma of the pancreas, proved by autopsy or operation, have been reviewed.

Primary carcinoma of the pancreas is most common in the fifth and sixth decades; the average age of incidence in this series was sixty-one years. It is more common in males than in females, the ratio in this series being 2.5 to 1. The head of the pancreas is most commonly involved; only the head was involved in almost 60 per cent of the cases in this series.

The diagnosis of primary carcinoma of the pancreas is largely by exclusion. Most commonly it must be differentiated from stone in the common duct. For this purpose, the Watson test is very useful.

Negative x-ray findings in the stomach and duodenum are also of great value as diagnostic aids.

Jaundice should not be considered a cardinal symptom. At least four and possibly seven cases in this series had no jaundice and no involvement of the common duct.

The prognosis is grave but by no means hopeless. Surgical intervention is the best palliative means. Cholecystoduodenostomy and cholecystojejunostomy are the operations of choice.

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POSTURAL HYPOTENSION*

Hourly and Daily Blood Pressure Variations

HARRY C. BROWNE, M.D., and BAYARD T. HORTON, M.D.

Rochester, Minnesota

A PHYSICAL examination is never complete until the blood pressure has been recorded with the patient in the recumbent as well as in the erect posture. Failure to carry out this simple procedure results in many patients going from physician to physician looking for help because of dizzy spells and weakness, and seldom finding the help. Hourly and daily records of blood pressure in such a case tell a graphic story, but thus far we have not seen such a record in print. The following report of a case, with accompanying comment and illustration, is presented to emphasize the importance of such a case in everyday practice and to show graphically the variations in blood pressure.

Report of Case

A white man, aged seventy years, a retired school teacher and farmer, entered The Mayo Clinic, September 15, 1938, complaining of spells of weakness and dizziness. The family history was essentially negative. The man always had been asthenic, although his general health had been exceptionally good. He had had influenza in 1918 and appendectomy had been performed for recurrent appendicitis in 1914.

He first had noticed the dizziness and weakness five years before we saw him. These symptoms had appeared following an attack of what had been termed "mucous colitis" which had been characterized only by an excess of mucus in the stools. The patient noted the weakness especially in the morning, after rising, and the dizziness on standing after he had been recumbent or sitting for some time. He experienced actual syncope at times. The attacks had come at occasional intervals until the year before his coming to the clinic. By the time of his examination they were occurring many times a day. Frequently, while walking, he would have to bend over to rid himself of dizziness or he would be obliged to sit or recline. These measures invariably brought relief. He was more uncomfortable and suffered more attacks during the cold seasons than at other times.

The man complained, in addition, of nocturia, and stated that he excreted a larger amount of urine during the night than during the day. Since December, 1937, he had been troubled by a postnasal drip and occasionally he easily expectorated blood-tinged mucus. He had no chronic cough or other respiratory symptoms. All his life he had been constipated, but aside from this and the attack of mucous colitis there were no other gastro-intestinal symptoms. He never had noticed any abnormalities of sweating; he complained of mild paresthesia in the fingers and toes.

On physical examination the patient appeared at least ten years younger than his actual age. There was no graying of the hair and no tendency to baldness. The skin was soft and senile changes were few. The tonsils were chronically infected. Nothing could be found in the upper respiratory passages to account for the blood-tinged mucus. There were a minimal amount of arteriosclerosis and a few vitreous opacities in the ocular fundi. Periapical dental infection was graded 2 and pyorrhea alveolaris was graded 1, on a scale in which 1 indicates minimal and 4 extreme difficulty. The carotid sinus reflex was not hyperactive. Examination of the thorax revealed only senile emphysema and a soft, apical, systolic murmur. The abdomen appeared to be normal with the exception that muscular tone was poor. The prostate gland was enlarged (grade 1) and prostatitis was graded 1. There was no residual urine. There were moderate sclerosis and tortuosity of the peripheral arteries. Neurologic examination revealed only slight impairment of vibratory sensation.

With the coöperation of the patient some special observations were made.

Observation 1.—The patient was hospitalized and hourly readings of blood pressure were taken while he was recumbent and erect (Figs. 1 and 2). The mean pressures with the patient supine were 140 mm. of mercury systolic and 90 diastolic and with the patient standing 65 systolic and 35 diastolic. The maximal variation in pulse rate was represented by the difference between a rate of 66 beats per minute when the patient was recumbent and 74 beats per minute when he was erect. In figures 1 and 2 it is seen that the blood pressure, while the patient was standing, followed a relatively level curve, without pronounced variations, but that while he was recumbent it exhibited definite fluctuations and at times was actually of hypertensive type.

Observation 2.—The patient was placed on a tilting table at an angle of 45 degrees, head uppermost, and was given, at intervals of three minutes, intravenous injections of 12.5 mg. of ephedrine sulfate totaling 100 mg. At the beginning of the observation his blood pressure was 70 systolic and 60 diastolic and his pulse rate was 60. At the end, his blood pressure was 84 systolic and 60 diastolic and his pulse rate was 100; he could stand and walk without dizziness or weakness.

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*From The Mayo Foundation (Browne) and the Division of Medicine (Horton), The Mayo Clinic, Rochester, Minnesota.

Observation 3.—The man was placed in a baker to determine in what areas sweating would appear.[11] Sweat was found everywhere on the body except for a small area on the inner aspect of each leg.

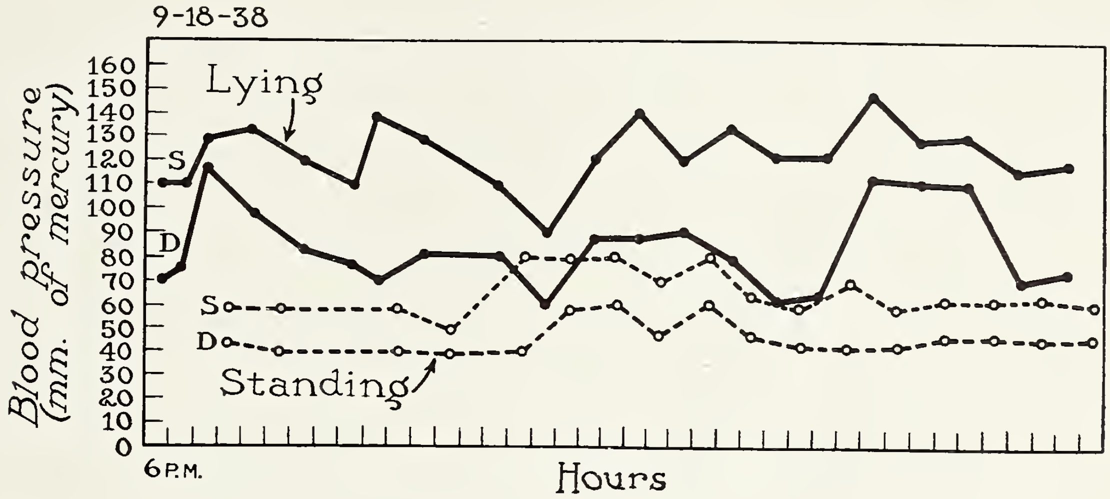

Fig. 1. Hourly readings of blood pressure over a period of approximately forty consecutive hours. Solid lines indicate blood pressure with patient recumbent and dotted lines, with patient standing. S indicates systolic and D, diastolic.

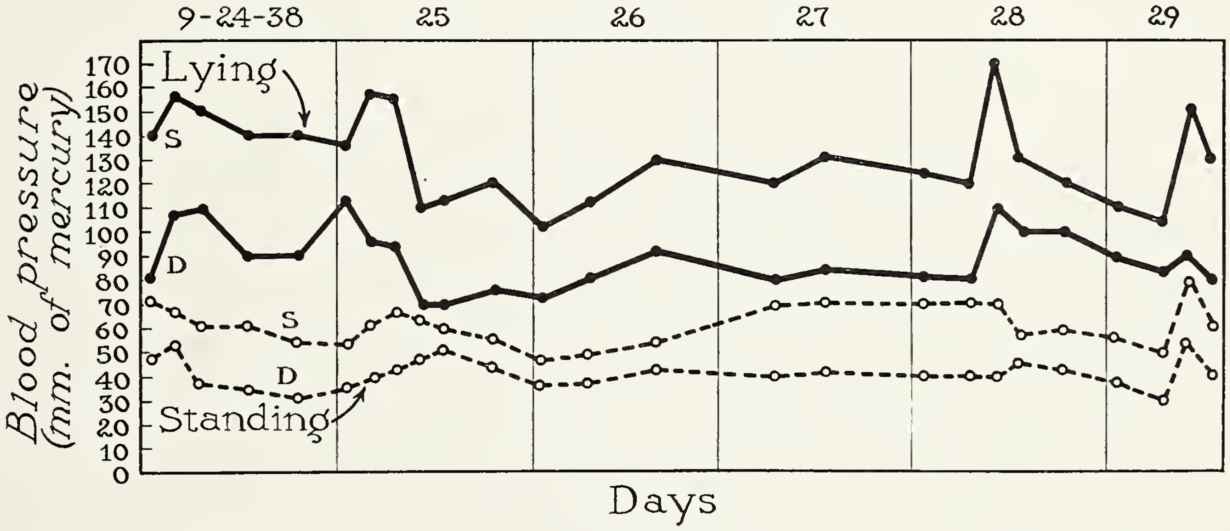

Fig. 2. Observations on blood pressure plotted as in Figure 1, but at less frequent intervals, over a period of approximately six days.

Observation 4.—For several days all urine excreted during the day (7 a.m. to 7 p.m.) was collected in one container and all that excreted during the night (7 p.m. to 7 a.m.) in another. The average diurnal output was 500 c.c. and the average nocturnal output 900 c.c.

Observation 5.—A tight abdominal binder was applied whenever the patient walked; this reduced the tendency toward syncope. When the patient was standing and the binder was removed he experienced marked giddiness and weakness.

Laboratory Examinations.—Results of most of the laboratory tests were negative. In terms of milligrams per 100 c.c., results of blood chemical examinations were as follows: urea nitrogen, 42 mg.; serum sulfates, 4.1; fasting blood sugar, 100; chlorides, 585; sodium, 308; potassium, 17.6; phosphorus, 2.4; calcium, 10. The basal metabolic rate was +6. Roentgenograms of the thorax were negative.

Treatment.—Various schedules of medication were tried, in which preparations of ephedrine, benzedrine and paredrine were administered. Ephedrine sulfate and paredrine hydrobromide seemed fairly satisfactory in overcoming the weakness and syncope but produced little change in the blood pressure. The aim of treatment in this type of case is to eliminate the disagreeable subjective sensations rather than to raise the blood pressure to normal.

For about two weeks (Table I) the daily schedule included administration of both ephedrine sulfate and paredrine hydrobromide and the patient noted improvement of his condition. Later (Table I), administration of paredrine hydrobromide was discontinued and ephedrine sulfate only was used. This later schedule was somewhat more satisfactory than the one that was followed during the first two weeks.

On dismissal, October 12, 1938, the patient's blood pressures, when he was sitting, were 100 systolic and 70 diastolic; when he was standing, 76 systolic and 50 diastolic and when he was recumbent, 142 systolic and 90 diastolic. Subjectively his condition was greatly improved.

Comment

Postural, or orthostatic, hypotension was first described as a clinical entity in 1925 by Brad-

TABLE I.—DAILY MEDICATION

Period	Time of day		Dose, mg.	Drug
First two weeks	A.M.	6	25	Ephedrine sulfate
		7	25	
		8	25	
			40	Paredrine hydrobromide
		9:30	20	
		11	20	
	Noon		25	Ephedrine sulfate
	P.M.	12:30	20	Paredrine hydrobromide
		2	20	
		3	25	Ephedrine sulfate
		3:30	20	Paredrine hydrobromide
Later	A.M.	6	25	Ephedrine sulfate
		7	25	
		8	25	
	Noon		25	
	P.M.	3	25	

bury and Eggleston when they reported three cases. Prior to that time, for many years it had been known that sometimes blood pressure changed markedly when posture changed. As early as 1905, Crampton showed that the pulse and blood pressure of man varied with change in posture.[4,5] Mortensen, in 1923, attributed the change in blood pressure to myocardial response rather than to vasomotor instability. Ghrist and Brown in 1928 first successfully used ephedrine in treating these patients. Korns and Randall employed benzedrine and the related compound, paredrine. They noted an increased pressor effect of the latter drug compared with the former and a decreased stimulating action on the central nervous system. From time to time additional cases have been reported[1, 2, 6, 12] in most of which the following phenomena have been exhibited: (1) a pronounced drop in systolic and diastolic blood pressure, and syncopal attacks, on change from the recumbent to the upright position; (2) no increase in pulse rate with this drop in blood pressure; (3) anhidrosis or decreased sweating and inability to stand hot weather; (4) excretion of more urine at night than during the day; (5) a false appearance of youth; (6) a slightly low basal metabolic rate; (7) signs of slight changes in the nervous system; (8) concentration of blood urea at the upper limit of normal.

Postural hypotension is not a disease but is an expression of inadequate control of the arterial system which may be associated with numerous diseases. As to its underlying cause, there is still dispute. In their original article, Bradbury and Eggleston attributed the condition to deficiency or paralysis of the myoneural junctions. Ghrist and Brown brought forth the hypothesis that the splanchnic vessels lacked resistance to shifts in blood mass and that vagal regulation of the cardiac rate with alterations in blood pressure was diminished or absent. MacWilliam expressed the belief that the difficulty lay in the lower extremities themselves, for he said there was little change in splanchnic blood mass with the sitting and standing posture; the only factor which changed was the position of the limbs. Crampton declared that, in the sitting posture the splanchnic circulation was maintained within limits by the support afforded by the limbs being flexed on the trunk. About as many different hypotheses have been propounded as the number of cases reported. The conclusion is that the vasomotor system plays the predominant rôle in the decrease of blood pressure in the standing position.

In the case reported here not all of the characteristics mentioned in a preceding paragraph were found. There were, of course, the marked fall in blood pressure, the syncopal attacks and the slow, unchanging pulse rate. Intravenous injection of ephedrine, however, caused acceleration of the pulse as has been pointed out (observation 2) and this showed that the normal function of the cardiac accelerator mechanism with change in blood pressure had not vanished. Our patient did not exhibit abnormal sweating and that he did not was an index of normal sympathetic control. Instead of inability to stand hot weather he suffered most during cold seasons. One of his most bothersome symptoms was excessive nocturnal urination. He possessed the false appearance of youth but not the characteristically low basal metabolic rate. The diminished vibratory sensation may have been a natural senile change and it was the only sign we could place in the category of slight changes in the nervous system. The concentration of blood urea was in the higher limits of normal as would be expected. It is interesting to compare the fluctuating curve this patient's blood pressure presented when he was recumbent with the relatively flat curve obtained when he was erect.

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THE VALUE OF PERSISTENCE IN THE TREATMENT OF THROMBO-ANGIITIS OBLITERANS: REPORT OF TWO ILLUSTRATIVE CASES*

ERIC E. WOLLAEGER, M.D., E. V. ALLEN, M.D., and RALPH K. GHORMLEY, M.D.

**Section on Orthopedic Surgery, The Mayo Clinic
Rochester, Minnesota**

THE pessimistic attitude relative to the outlook for patients with thrombo-angiitis obliterans has gradually changed to a more optimistic one. That much can be accomplished for such patients is more apparent as experience in medical, neurosurgical and conservative orthopedic treatment of this condition accumulates. This change in attitude has resulted from development of logical methods of treatment and the gradual recognition that persistence is most important. In considering treatment of patients with thrombo-angiitis obliterans with gangrenous lesions, ulcers or pain while the limb is at rest, both patient and physician must be thoroughly imbued with the idea that treatment over a comparatively long period of time is essential if the best results are to be accomplished. It is sometimes well to point out to a patient that many diseases, such as tuberculosis, for example, require treatment for months and that thrombo-angiitis may be as demanding of time. When this situation is discussed with a patient with thrombo-angiitis obliterans soon after treatment is begun, he is easily reconciled to slow progress, a state of mind which in itself seems to hasten improvement. It is the purpose of this report to stress the importance of persistent treatment.

Report of Cases

Case 1.—A twenty-seven year old salesman of Scotch-English descent entered The Mayo Clinic on February 1, 1937, because of painful ulcerations on the first, second and third left toes, which had been present for one month.

There was no family history of vascular disease except that his father had had hypertension. Six years before admission the patient had frozen his feet but recovery had occurred promptly and there had been no residual symptoms. He had begun to smoke cigarettes at the age of seventeen and he had consumed between twenty and forty of them a day since that time. His past history was otherwise irrelevant.

Two and a half years before admission the patient noticed several red tender lumps along the veins of the lower part of both legs, which disappeared in about a month.

Two and a half months before admission, while the patient was recovering from an attack of "influenza," there was a sudden onset at rest of marked numbness, coldness, pallor and pain involving the left foot. These symptoms were so severe that he was taken to a hospital, where he was treated by the application of hot and cold packs, intravenous injection of a solution of sodium chloride and some intramuscular injections. The condition of his foot gradually improved so that one month after the onset of the symptoms he was once more walking about. At this time he experienced a similar episode of sudden onset of pain and numbness in his left foot, the distal half of which became cold and white. A few days later a Leriche operation (periarterial sympathectomy) was performed on his left femoral artery. One month before admission, the left first, second and third toes became darkly discolored and ulceration of them occurred.

During the one and a half months prior to admission the gangrenous toes were affected with pain, which was severe enough to prevent sleep and which was partially relieved by allowing the left foot to hang over the edge of the bed. The patient's appetite also was diminished so that he lost 20 pounds (9 kg.) in weight.

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*From the Mayo Foundation (Wollaeger, Fellow in Medicine) and the Division of Medicine, The Mayo Clinic (Allen).

TABLE I. RESPONSE OF TEMPERATURE OF SKIN OF TOES AND FINGER OF A PATIENT SUFFERING FROM THROMBO-ANGIITIS OBLITERANS TO INTRAVENOUS INJECTION OF TYPHOID VACCINE

	Temperature*				
	Mouth	Toes			Finger
		Right first	Right fourth	Left fourth	Right third
Before injection	99.5 (37.5)	85.8 (29.9)	85.5 (29.7)	83.7 (28.7)	87.1 (30.6)
After injection	101.3 (38.5)	97.3 (36.3)	96.6 (35.9)	88.9 (31.6)	99.1 (37.3)

*In degrees Fahrenheit; figures in parentheses are in degrees Centigrade.

On examination at The Mayo Clinic the patient was found to weigh 140 pounds (64 kg.). The oral temperature was 97.6° F. (36.4° C.), the pulse rate 112 beats per minute and the blood pressure was 115 mm. of mercury systolic and 90 diastolic. The results of the general examination, exclusive of the extremities, were negative except for tachycardia and moderately enlarged tonsils.

The muscles of the entire left leg were somewhat atrophied, weak and flabby. The entire left second toe was black, shrunken and crusted and there were similar changes on the dorsum, tip and lateral surface of the great toe and on the dorsum at the base of the third toe. The distal half of the nail of the left first toe had been removed (Fig. 1). Pulsations were normal in radial, ulnar, femoral, popliteal and posterior tibial arteries bilaterally. Pulsations could not be felt in the dorsalis pedis arteries bilaterally. There were no unusual changes in color of the skin of the hands and right foot as a result of elevation or dependency. Color changes dependent on posture of the left foot could not be determined because of staining of the skin with mercurochrome. The response of the temperature of the skin of the toes to fever induced artificially by the intravenous injection of typhoid vaccine is shown in Table I. This study indicated marked impairment of circulation to the left fourth toe. Studies of the temperature of the skin of the left first, second and third toes were not made because attachment of the thermocouple junctions to them caused pain.

Laboratory studies: The results of routine laboratory studies, including determination of hemoglobin, enumeration of erythrocytes and leukocytes in the blood, a serologic test for syphilis and differential leukocyte count, were essentially normal. On repeated urinalyses traces of albumin were found and in several samples there was slight reduction of Benedict's solution. The blood sugar was 72 mg. per 100 c.c. of blood. Sedimentation of the blood was 17 mm. in an hour. Roentgenographic examination of the lungs and left foot gave negative results.

A diagnosis of thrombo-angiitis obliterans with two episodes of sudden arterial occlusion was made.

The patient was treated in the hospital. Smoking was prohibited. Most of the time the patient rested in bed and weight-bearing on the left foot was carefully avoided. Radiant heat was applied to the feet by means of carbon filament bulbs in a cradle. The temperature of the air about the feet was maintained at about 90° F. (32.2° C.). The left foot was soaked several times daily in a warmed solution of boric acid or chloramine. Intermittent suction and pressure could not be employed because this procedure increased the pain. On the day following admission to the hospital, fever was induced artificially by injecting intravenously a vaccine containing killed typhoid and paratyphoid A and B organisms. Pain was accentuated as a result of this procedure but it was considerably diminished the following day. Subsequent intravenous injections of vaccine were given at intervals of two to eight days and the patient received twenty-nine of them during the five months he was in the hospital. During this same period he received passive vascular exercises on the Sanders bed for 308 hours. Anodynes and sedatives were administered to relieve pain and induce sleep. During a period of five months he received the following amounts of drugs; morphine sulfate 9.1 grains (0.59 gm.), dilaudid 2.2 grains (0.14 gm.), codeine sulfate 233 grains (15.1 gm.), acetylsalicylic acid 1,580 grains (102.4 gm.), phenobarbital 139 grains (9.0 gm.), sodium amytal 39 grains (2.5 gm.) and pentobarbital sodium 71.5 grains (4.63 gm).

On this regime progress was slow and indeed for a considerable time was doubtful. The patient continued to have a great deal of pain so that fairly large amounts of opiates were required—especially during fever induced by intravenously injected vaccine. It was thought wise to defer any operative removal of the gangrenous areas until such a time as complete demarcation had occurred and the blood supply to the surrounding tissue had been developed as much as possible, or even to wait until spontaneous amputation should occur. Accordingly some other method for the relief of pain had to be employed. Three weeks after admission, under infiltration anesthesia the left superficial and deep peroneal nerves were resected in the lower leg and the left posterior tibial nerve was crushed. After this operation there was reduction of pain in the left foot of about 50 per cent, although partial sensation remained in the distribution of the posterior tibial nerve on the plantar surface of the foot.

Two and a half months after admission a second operation was performed. Under pentothal sodium anesthesia the second left toe was amputated at the line of demarcation, that is, through the metatarsophalangeal joint, and the first phalanx of the great toe, which was projecting into the wound, was completely removed, as was the nail of this toe, under which considerable pus had accumulated.

Subsequent healing was slow but progressive until the time of the patient's discharge from the hospital three and a half months after admission, at which time small areas of granulation tissue were present at the sites of removal of the second toe and of the first toenail and at the area in which the phalanx of the first toe had been removed (Fig. 2). The patient returned to the hospital in a week, however, because of ulceration in these areas brought on by walking and weight-bearing. A month later (five months after the first hospital admission) he was again discharged, at which time healing was complete.

In a letter received from the patient four months after dismissal he stated that he was enjoying good health and leading an active life with no recurrence of ulceration or return of pain. He had gained 45 pounds (20 kg.) in weight. Thirteen months after dismissal the patient stated he was entirely well.

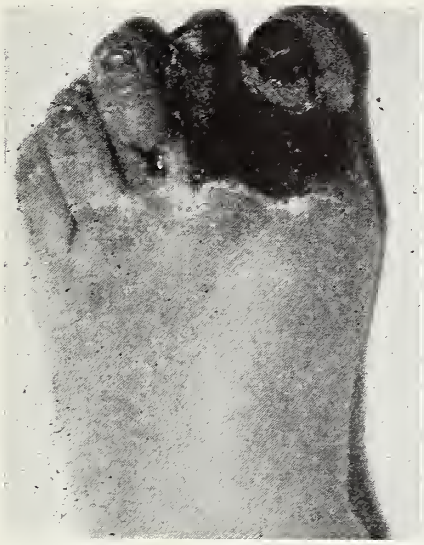

Fig. 1. Thrombo-angiitis obliterans. Appearance of foot at time of admission of patient to hospital.

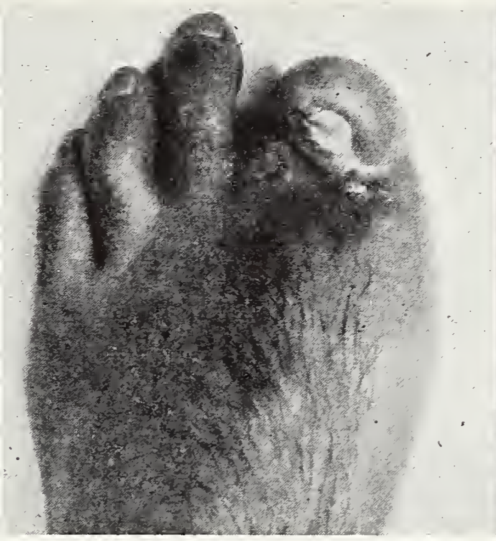

Fig. 2. Thrombo-angiitis obliterans. Same extremity as pictured in Figure 1 but after treatment.

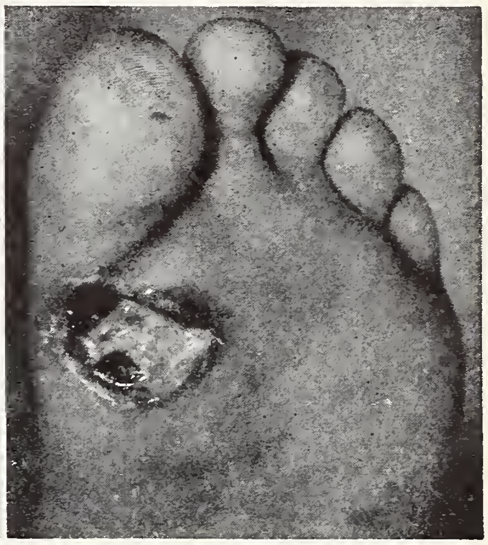

Fig. 3. Thrombo-angiitis obliterans, with gangrenous ulcer on plantar surface of foot.

There can be no valid criticism of the diagnosis of thrombo-angiitis obliterans in this case. The patient had had superficial phlebitis, which, in conjunction with occlusive arterial disease, is almost pathognomonic of thrombo-angiitis obliterans. Sudden arterial occlusive disease occurs commonly in this condition. In a study of 225 cases, Kvale and one of us (Allen) found that sudden occlusion occurred in the course of well established thrombo-angiitis obliterans in fifteen cases, or 7 per cent, and as an original event in eleven cases, or 5 per cent, of the cases. This case which we have presented seems clearly exemplary of the latter situation. The fortunate outcome can be attributed to no single method of treatment, for many methods persistently carried out seem clearly responsible.

Case 2.—The patient, a thirty-five-year-old oil field worker of Irish descent, entered The Mayo Clinic on January 30, 1937, because of a painful ulcer on the medial aspect of the ball of the left foot, which had been present for one month.

Family and past histories were irrelevant except that the patient had smoked one package of cigarettes a day for many years.

In the fall of 1934, about two years before admission, the patient developed a red, painful nodule on the radial aspect of the left lower arm, which seemed to migrate around the arm and also up its length to the elbow. Redness and pain were intermittent and there was no fever. In three or four months the nodule disappeared entirely.

One year before admission the patient began to have claudicatory pain in the arches of the feet. Six months later similar pains began in the calves of his legs, allowing him to walk only a block or so before he had to stop and rest.

During the year previous to admission the patient noticed spots of cyanosis on the fingers of the left hand (most marked on the third and fifth fingers) and on both feet. These patches were noticeable only on exposure to cold and disappeared with the application of warmth. Pallor of the fingers and toes was present when these parts were elevated, but there was no pain while they were at rest. On two occasions the patient had developed small ulcers along the sides of the nails on the third and fifth fingers, each requiring several weeks to heal.

TABLE II. GRADE OF PULSATION IN EXTREMITAL ARTERIES OF A PATIENT SUFFERING FROM THROMBO-ANGIITIS OBLITERANS

Artery	Pulsations	
	Right	Left
Radial	4	0
Ulnar	4	0*
Femoral	3 to 4	2 to 3
Popliteal	2	0
Posterior tibial	0	0
Dorsalis pedis	0	0

Grade 0—No pulsation.
Grade 4—Normal pulsation.

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*Though pulsations were absent in the left ulnar artery, there was present a fairly good sized collateral artery on the dorsum of the ulnar side of the lower arm in which pulsations were graded 2.

Two months before admission the patient noticed a small blister on the medial aspect of the ball of the left foot. This increased in size and was accompanied by so much pain and swelling of the foot that he was forced to take to his bed a month later. The blister was opened and trimmed by his physician, but in spite of this and other treatment, including intermittent suction and pressure, injections of tissue extract and

TABLE III. RESPONSE OF TEMPERATURE OF SKIN OF TOES AND FINGER OF A PATIENT SUFFERING FROM THROMBO-ANGIITIS OBLITERANS TO INTRAVENOUS INJECTION OF TYPHOID VACCINE

	Temperature*					
	Mouth	Toes				Finger
		Right first	Right fourth	Left first	Left fourth	Left fifth
Before injection	99.5 (37.5)	80.2 (26.8)	81.0 (27.2)	83.5 (28.6)	81.9 (27.7)	83.3 (28.5)
After injection	102.9 (39.4)	85.5 (29.7)	84.2 (29.0)	86.9 (30.5)	84.9 (29.4)	97.5 (36.4)

*In degrees Fahrenheit; figures in parentheses are in degrees Centigrade.

insulin and two injections of typhoid vaccine, the ulcer failed to heal. The patient continued to smoke most of the time during his illness.

On examination at the time of admission the patient was well nourished. The oral temperature was 98.2° F. (36.8° C.). The pulse rate was 80 beats per minute and the blood pressure was 130 mm. of mercury systolic and 80 diastolic. The results of a general physical examination were essentially negative except for the extremities. Over the medial aspect of the first metatarsophalangeal joint of the left foot was a traumatic, infected, gangrenous ulcer, 3 cm. in diameter and 1.5 cm. deep (Fig. 3). The ulcer and the surrounding infected area were intensely tender and the left foot was swollen, grade 2, on a basis of 1 to 4. There was considerable pain in the region of the ulcer while the foot was at rest, which prevented the patient from keeping his left leg in bed and caused him to allow it to hang over the edge of the bed most of the time.

Circulation in both feet as well as in the left hand was appreciably impaired as shown by abnormal pallor in the elevated position and abnormal rubor in the dependent position. Pulsations in many of the main arteries of the extremities were impaired as demonstrated in Table II.

The response of the temperature of the skin of the toes to fever artificially induced by the intravenous injection of typhoid vaccine is shown in Table III. This study indicated marked impairment of circulation to the toes of both feet. Collateral circulation to the left hand was adequate.

Routine laboratory studies, including numerous urinalyses, determination of the blood hemoglobin and enumeration of the erythrocytes and leukocytes in the blood, gave normal results. Quantitative determinations of blood lipoids resulted as follows: Total fats, 726 mg. per 100 c.c.; cholesterol, 252 mg. per 100 c.c., and fatty acids, 474 mg. per 100 c.c. Roentgenographic examination of the lungs and of the left foot gave negative results.

A diagnosis of thrombo-angiitis obliterans was made.

The patient was treated in the hospital, where he rested in bed most of the time, avoiding all weight-bearing on the ulcerated foot. His feet were protected by a wooden cradle in which radiant heat was applied to them by means of carbon filament bulbs, which maintained the air about his feet at a temperature of about 90° F. (32.2° C.). The left foot was soaked several times a day in a warmed solution of boric acid, chloramine or potassium permanganate. Zinc peroxide paste was applied to the healing ulcer daily for several weeks during the midportion of his stay in the hospital. On the day following admission to the hospital, fever was induced artificially by the intravenous injection of a vaccine containing typhoid and paratyphoid A and B organisms. After an initial accentuation of pain this procedure resulted in a marked relief from pain on the following day. Fifteen subsequent intravenous injections of vaccine were made at two to eight day intervals during the two months the patient was in the hospital. During this period of time he received, daily, passive vascular exercises on the Sanders bed for a total of forty-four hours. Intermittent suction and pressure also were applied to the left leg daily for a total of eighty-two hours. Smoking was strictly prohibited throughout treatment. Moderate amounts of anodynes and sedatives were administered for the relief of pain and the induction of sleep.

From the beginning the patient's progress was slow because of the great size and depth of the ulcer on his foot, which gradually became filled with granulation tissue and finally was covered by epithelium. Even at the time of his dismissal, two months after admission, there was a fairly deep depression at the site of the former ulcer. In a letter received three months after dismissal the patient stated that this depression was almost entirely filled in and that he had been working for two months, though he could not stand on his feet for any great length of time.

A second letter, eight months after dismissal, stated that the patient was on his feet eight hours a day without pain except from walking, which brought on claudication at three blocks. There was still slight tenderness to pressure over the site of the old ulcer. The color of his feet was said to be better.*

Two important lessons can be gained from a study of this case report. Minor surgical procedures are frequently ill advised, for they may cause gangrene or gangrenous ulcers in many cases. Barker's study showed that such undesired results had followed injudicious surgical procedures in a third of the cases of thrombo-angiitis obliterans with gangrenous lesions. The prospect for recovery when gangrene or gangrenous ulcers are present is substantially less than when they are absent. Injudicious surgical procedures consist chiefly in removal of the toenails and corns or of calluses, and in incision for suspected abscess. We recommend strongly that no local surgical procedures be performed in any case until blood supply has been proved adequate or until the surgeon has carefully considered the ill effects which may follow such procedures when blood supply is diminished. The second lesson is that lesions which appear at first glance to be severe enough to justify amputation may disappear as a result of intensive medical treatment.

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*Since this paper was written the patient writes eighteen months after dismissal that the condition of his feet is excellent. There are no ulcers of the feet or pain except intermittent claudication when walking a considerable distance. The nails are growing.

Comment

The two cases reported emphasize that gangrenous lesions in thrombo-angiitis obliterans do not always necessitate amputation. On the contrary, intensive medical treatment may cause healing and restoration of an extremity to useful function. An outline of the treatment of thrombo-angiitis obliterans is beyond the scope of this paper. It has been presented adequately elsewhere. Treatment is seldom uniform in type but usually is an individual affair, varying greatly from case to case, and may necessitate close coöperation of internist, orthopedist and neurosurgeon. In this presentation we have emphasized the importance of persistence of medical treatment in many cases. It is impossible to state precisely when medical treatment should be abandoned for amputation, as criteria for amputation vary greatly from case to case. In general, severe pain which cannot be controlled adequately by medical or neurosurgical means, or gangrenous lesions which do not respond to intensive medical treatment over a considerable period of time, require amputation.

The physician dealing with many patients with thrombo-angiitis obliterans sees two types of cases for which decision relative to treatment is not difficult. There are cases for which prompt amputation is advisable and cases for which amputation need not be considered. For the latter cases medical treatment and perhaps sympathectomy are clearly indicated. In a third group of cases the question arises at once whether or not amputation is advisable. In such circumstances it is best to treat patients conservatively for a minimum period of several weeks. If unsatisfactory progress results from this regime, then amputation may be considered. If the treatment causes improvement, it may be continued.

The physician may object at once that thrombo-angiitis obliterans is a chronic disease and that healing of lesions such as those described does not necessarily mean cessation of the disease. He may point out that amputation may be advisable eventually and that there is little reason for deferring the time when such treatment is necessary. Such an attitude prompts decision to amputate limbs as soon as the diagnosis of thrombo-angiitis obliterans is made. Fortunately, the poor logic of this is apparent, for many patients with thrombo-angiitis obliterans have two fairly normally functioning legs all their lives; many others keep one normally functioning leg.

Other physicians may point out that the cost of conservative treatment over a long period of time may be great. It is almost always good policy to discuss the situation frankly with the patient. If he desires a trial of conservative treatment, it seems to us he should have it. If such treatment impresses him as too costly and too uncertain of producing good results, amputation may be advisable. Too many factors influence a patient to allow advising him dogmatically. The physician should not allow a poorly founded attitude of pessimism on his part to influence the patient to accept amputation when it may not be necessary. We agree that some patients are treated conservatively too long but in many instances "too poor" treatment is mistaken for "too long" treatment. We cannot agree that the cost of an intensive but conservative program for a few weeks is too great if there is a chance of producing healing of gangrenous lesions and quiescence of the disease. We believe that the incidence of amputation for thrombo-angiitis obliterans can be reduced sharply. Earlier recognition, better conservative treatment and less haste to amputate in many cases are very desirable. Much can be accomplished in producing results which amply justify conservatism. We have presented two illustrative cases to support this contention.

References

1. Barker, N. W.: The danger of gangrene of the toes in thrombo-angiitis obliterans and arteriosclerosis obliterans. Jour. A.M.A., 104:2147-2149, (June 15) 1935.
2. Kvale, W. F. and Allen, E. V.: Sudden arterial occlusion in thrombo-angiitis obliterans. Am. Heart Jour., 12:458-466, (Oct.) 1936.

◆ CASE REPORT ◆

PICROTOXIN TREATMENT OF BARBITURATE INTOXICATION

A. E. Cardle, M.D., and Wayne S. Hagen, M.D.
Minneapolis, Minnesota

THE recent report of the Council on Pharmacy and Chemistry of the American Medical Association[1] gives the present status of the use of picrotoxin in the treatment of poisoning by the barbiturates. The following case is reported because it is believed to have demonstrated to the authors the efficacy of the use of this drug and also because it illustrates a clinical example of the picrotoxin-barbiturate antagonism or the antidotal action of picrotoxin in barbiturate intoxication.

Picrotoxin is a bitter neutral principle prepared from Anamirta paniculata (Cocculus indicus). It stimulates the motor and inhibitory centers in the medulla, especially the vagus and respiratory centers. Picrotoxin ($C_{30}H_{34}O_{13}$) may be broken up into Picrotoxinin ($C_{15}H_{16}O_6$) and Picrotin ($C_{15}H_{18}O_7$); is soluble in eight parts of alcohol or 240 parts of water. Koppanyi et al[6] found that it had a distinct awakening or cortical effect aside from its medullary stimulating action. The studies of Maloney, Fitch and Tatum[4] in 1931 called attention to the antidotal action of picrotoxin in the treatment of barbiturate poisoning. Subsequent reports by these same authors[5] established a clinical basis for the use of this drug and the report of four cases by Kohn, Platt and Saltman[3] and an additional report by Bleckwenn and Masten[2] of six cases have added further proof of the clinical value of picrotoxin as an antidotal or antagonistic agent against the toxic effects of overdoses of the barbitals.

Case Report

A white woman, aged twenty-four, weighing 108 pounds, sixty-four inches in height, was admitted to the hospital on November 17, 1938, in an unconscious and comatose condition. Barbital intoxication was suspected and it was estimated that twelve hours had elapsed since the taking of sixty grains of phenobarbital (luminal) obtained from a local drug store.

The patient's color was good, respirations slow and shallow, and she was comatose. Her temperature was 99.2 F., pulse rate 74, respiratory rate 16, and the blood pressure 92 systolic, 64 diastolic. The pupils were miotic (3 mm.), equal, regular, and did not react to light. The eyes were fixed in the midline, the corneal and conjunctival reflexes weak and sluggish. Her mucous membranes were moist and slightly cyanotic. The neck muscles were flaccid and all deep tendon reflexes were greatly reduced. The Babinski reflex was bilaterally negative. The admission diagnosis was: Overdose of hypnotic drug, probably barbital.

Course.—Gastric lavage was performed at once and only a small amount of fluid was found in the stomach. The bladder was emptied by catheterization and the urine found normal. The hemoglobin was 86 per cent; R.B.C. 4,620,000; W.B.C. 18,400. Five hundred c.c. of 10 per cent glucose in normal saline was given intravenously. The patient's temperature rose to 104.6 F.; pulse to 120; respirations to 32 per minute. Caffeine sodium benzoate (gr. 7½) was given subcutaneously and repeated with little apparent effect. The intravenous administration of picrotoxin was begun nine hours after admission, beginning with 1 mg. and repeating in increasing doses every twenty minutes until 6 mg. were given. Two to four hours were then allowed to elapse between doses, which were then increased to 9 mg. and then to 12 mg., depending on the blood pressure reading and the character of the pulse and respirations. During the first twenty-four hours of picrotoxin administration the patient received 111 mg. of picrotoxin intravenously and in the next twelve hours 36 mg. of picrotoxin by the same route, thus receiving a total of 147 mg. of picrotoxin in the thirty-six hour period. At the end of this time she developed a return of the deep reflexes, her temperature and pulse declined, and respirations became stabilized and deeper. Cyanosis disappeared and did not return. Feeding by duodenal tube was carried on for twelve hours, when oral feeding was possible. Strychnine gr. 1/20 was given subcutaneously three times daily after return of consciousness for its tonic and supportive effect. Recovery was considered well under way forty-eight hours after the institution of the picrotoxin administration. Strength and function of the upper extremities, however, returned late and weakness of these members persisted for seventy-two hours. The patient was released from the hospital on the fifth day after admission and was oriented, mentally clear, her temperature 99.4 F., pulse rate 90 per minute, respiratory rate 22 per minute, blood pressure 120 systolic and 66 diastolic.

The patient admitted having taken forty tablets of 1.5 gr. phenobarbital (luminal) or a total of sixty grains. It was observed during the administration of the picrotoxin that giving the drug intravenously at the rate of 1 mg. per minute did not produce any apparent untoward effects and that when the dosage reached 6 to 12 mg. certain signs of clinical improvement became apparent. This was evidenced by: (1) a rise of systolic and diastolic blood pressure; (2) a perceptible slowing of the pulse rate; (3) a deepening and slowing of the respirations; (4) a decrease of the cyanosis; and (5) a return of voluntary muscular movements. The return of consciousness occurred after the administration of a total of 147 mg. of picrotoxin in divided doses over a period of thirty-six hours.

Comment.—From the publications of Tatum et al[4,5] it was estimated that 1 mg. of picrotoxin is antidotal for 30 to 40 mg. of a barbital derivative. Upon the basis that 1 mg. of picrotoxin is antidotal for 30 mg. of phenobarbital, we have calculated that the 147 mg. of picrotoxin given this patient was sufficient to counteract 4,410 mg. of phenobarbital.

As this patient took 3,900 mg. (60 grains) of phenobarbital she received sufficient picrotoxin according to this method of calculation.

(Continued on Page 332)

HISTORY OF MEDICINE IN RAMSEY COUNTY

BY J. M. ARMSTRONG, M.D.

(Continued from April issue)

1869

Though not pertinent to a history of medicine in Saint Paul, it may be noted that the Minnesota State Eclectic Medical Society was incorporated on May 26. E. M. Morehouse, M.D., was chosen President; Dr. S. M. Morrison, vice president; N. L. Culver, recording secretary; Dr. L. F. Case, corresponding secretary; and Dr. Charles Lee, treasurer. The censors were A. F. Elliott, M.D., J. W. B. Wellcomb, M.D., E. M. Morehouse, M.D. Some were doctors, some M.D.s, and some apparently were neither. It would be interesting to secure further knowledge of this organization. On November 14, the Southern Minnesota Eclectic Medical Society was incorporated. It was a larger organization than the former, and most of the men mentioned above belonged to it.

The usual number of itinerant physicians were in evidence this year. The city was growing, and apparently the field appeared promising to them. Several additional reputable physicians settled in Saint Paul, the first being Dr. T. B. De Grosbois. He formed a partnership with Dr. Guernon, but that association lasted only a few months, and he remained but a short time. He was a graduate of McGill University. Next came Dr. Charles H. Boardman, son of the Rev. Henry A. Boardman, pastor of one of the Presbyterian churches. Dr. Boardman became a prominent member of the Ramsey County Society in later years. Dr. E. Lemire, who stated that he was a graduate of Victoria University at Montreal, late editor of the *Gazette Medicale* and late secretary of the Medico-Chirurgical Society of Montreal, came to enter practice in September. Apparently the outlook was not favorable for he left after two months. As a matter of fact, the French element in our population, which was quite large previous to 1860, had now dwindled to a small minority and most of them were in very moderate circumstances. It is doubtful whether there was more than a living for one man to be made from a clientele composed largely of persons of French Canadian extraction. In November, Dr. William Ray, who had left Chaska in 1868 for Missouri and had practiced also in Iowa, returned to Saint Paul. A Dr. William Banks came with him. In August, Dr. Guy D. Daly (or Daley), who had come the year before, was elected county physician, but he resigned in December, going to Duluth. A retired physician from Missouri named William Baldwin also came to Saint Paul this year for his health. He did a little practice and remained till the time of his death in 1886.

Among the advertising physicians who came to Saint Paul this year was one Robert Hunter, who hailed from New York. He was a most persistent advertiser and used a column at least once a week, printing lectures, recommendations, et cetera. He brought with him "Dr. Rudolph Schiffmann, late of the St. Louis City Hospital, who will also act as interpreter for such German patients as do not speak English." Doctor Schiffmann remained many years. He made a fortune selling a cure for asthma. A Dr. Hunter applied for membership in the Ramsey County Medical Society in 1870, but he was rejected unless he ceased his "objectionable practice." Probably this was Dr. Robert Hunter. Late in the year a Dr. J. M. McKelvey came to Saint Paul, but remained only a short time.

The income tax returnes of Saint Paul physicians for the year ending May, 1869, are as follows. The figures include $1,000 exempt:

A. G. Brisbine	$1,094	D. W. Hand	$1,138
S. D. Flagg	2,648	John Steele	1,722
J. H. Murphy	1,500	J. H. Stewart	4,685
Russel Post	4,559	A. Wharton	1,250
T. C. Schell	1,331	Samuel Willey	1,707
F. R. Smith	1,671		

In January, 1869, Col. D. A. Robertson began the publication of a magazine called *The Minnesota Monthly*. Thirteen numbers were published. It was largely devoted to agriculture. Every number, however, contained articles on household medicine or hygiene, most of them by Brewer Mattocks. In one of them Mattocks referred to Drs. Hunter and Duval as quacks and stated that the latter was in jail awaiting trial for the murder of his wife. In the number published in July, 1869, the following announcement was made:

> Advertisements of quack medicines, gift enterprises, confidence games, clandestine obscenity and vice, and swindling nursery men and tree peddlers, humbug seeds, etc., etc., will be rigidly excluded.

There was considerable smallpox in Saint Paul during the first half of the year, about 125 cases being reported to the health office. In December the papers recorded that Dr. Hand performed Donder's operation of iridectomy for glaucoma, apparently the first time this operation had been performed in the city. There was a Dr. Somers in Saint Paul at this time and a Dr. F. Kerston. The latter was caught robbing George Presley's saloon. His office was upstairs.

Two deaths of physicians are recorded, that of John V. Wren, aged thirty-five, on December 11 at Magnolia, Mississippi; and B. L. Sellers at Wyalusing, Wisconsin, where he had resided for about two years. Both formerly lived in Saint Paul. Dr. Thomas E. Massey, who had resided in the city from 1857 to 1863, moved to Louisville, Kentucky. The following paragraph appeared in the papers on September 28:

> Dr. Thomas J. Vaiden, who once owned ten thousand acres of land in Wisconsin and Minnesota and mortgaged nearly all to go into the milk business and never sold a pint of milk, is practicing his profession at Mt. Zion, Tenn. He is about publishing a 600-page book on his favorite subject of a Pure Republic vs. Imperialism, etc., a la "America Vindicated."

This was the Dr. Vaiden who came to Saint Paul in 1855 and left about 1866. Vaiden was a Virginian by birth and graduated from the University of Pennsylvania in 1831.

The narrative has now been carried to the year 1870. There seems to be no necessity of making a summary of the decade from 1860, but a few words perhaps may be said of the contributions to medical literature by Saint Paul physicians during these years. Only a few references, other than those already mentioned, can be found.

Dr. D. W. Hand, aside from his army reports, contributed an article on cholera, as he experienced it among the troops in 1865. Dr. Alfred Wharton reported a case of "Puerperal Convulsions Treated with Chloroform," in the *Buffalo Medical and Surgical Journal* (Vol. I, No. 7, p. 213, February, 1862). Dr. Brewer Mattocks was author of an article on "The Effect of Climate upon the Lungs, with Special Reference to Minnesota" in the *Medical Record* for May 15, 1869. Dr. Samuel Willey contributed two articles: "Obstetrical Cases," in the *Cincinnati Lancet and Observer* (Vol. IV, No. 2, December, 1861), and "Dachylius Aculeatus" in the same journal (Vol. VI, N. S., p. 19, June, 1863). This last is an important communication as it is the first report of the finding of this parasite in the United States, and but one other case of infection has been reported in this country since. A number of articles written by physicians who later came to Saint Paul to reside may be found, but they are not included because these men were not residents at this time.

It seems worthwhile also to include here a bibliography of Thomas J. Vaiden, because listing his work gives us information as to his various places of residence, and many of them are not listed in the Surgeon General's Catalogue.

Treatise on Domestic Practice, Gainesville (Ala. ?), 1844, 8 vo.
Domestic Practice, Medical Tract to Illustrate Preceding Publications, Gainesville, 1844, 8 vo.
Commencement of a Practical System of Medicine, etc., Mobile, 1845, 8 vo.
Medical Companion, N. Y., 1852, 8 vo.
Medical Companion, Second Series, N. Y., 1852, 8 vo.
Rational Religion and Morals, etc., N. Y., 1852, 8 vo., by Thomas J. Vaiden of St. Louis
America Vindicated, N. Y., 1855, 12 mo.
Bible of Rational Mind and Religion, et cetera, Boston, 1876 (?)

A review of medical activities during the sixties should also include a further mention of the Saint Paul Academy of Medicine and Surgery, which was organized March 1, 1860, and incorporated June 10, 1861. This was the first local medical organization to be established in the county. The officers and members for 1860 were:

President—Thomas R. Potts
Vice President—A. G. Brisbine
Treasurer—John Steele
Secretary—Alfred Wharton
Members—D. W. Hand, Samuel Willey, William H. Morton, F. Rieger, and J. H. Stewart; Honorary Members, Paul B. Goddard, Philadelphia; Joseph Leidy, Philadelphia; John Watson, New York; John L. Atlee, Lancaster; George McCook, Pittsburgh; Erastus Cushing, Cleveland; and John H. Murphy, St. Anthony.

On May 7, 1861, an eight-page pamphlet containing the constitution and by-laws of the Academy was published. This gives the officers for that year: A. G. Brisbine, president; Samuel Willey, vice president; D. W. Hand, librarian; the secretary and treasurer were the same as in 1860. The constitution states that "No person shall be admitted to the fellowship of this Academy . . . until he exhibits . . . satisfactory evidence of his being a graduate of some respectable medical school, recognized by the National Medical Association." The initiation fee was twenty dollars. In addition to monthly gatherings, an annual meeting was required which should take place on the first Tuesday in May of each and every year. Added to the pamphlet is the following note:

> "It affords the Secretary much pleasure to state, that at the termination of the first year of the existence of the Academy of Medicine and Surgery, it is in a most flourishing condition, and its permanent success established beyond the remotest doubt. Although numbering but nine members, and during a period of great monetary depression, the Academy is in

the possession of two spacious rooms, suitably furnished and well lighted with gas; has procured at no little expense, a superior microscope, an analytical chemical apparatus, and an electrical machine; for the skillful selection of all which the Institution acknowledges its indebtedness to the kindness of Dr. Paul Beck Goddard of Philadelphia.

"A medical library has been commenced, which bids fair to attain a very respectable size through the contributions of physicians and by purchase.

"The Treasurer reports:

Cash received during the fiscal year	$620.72
Cash expended during the fiscal year	462.93
Balance on hand at end of year	362.07

"It may be mentioned that the Academy early adopted the Code of Ethics of the National Medical Association.

"On behalf of the Academy, the undersigned would most cordially invite physicians from abroad, upon visiting Saint Paul, to make themselves known to the members thereof who will show them every attention in their power.

Alfred Wharton, M.D., *Secretary*

"Saint Paul, Minn., May 7, 1861."

The Academy obtained the positions of city and county physician for its president, and the members took turns in filling those positions, the emoluments of these offices being turned over to the Academy. A respectable income was thus assumed, during the earlier years at least.

Had this organization been able to survive the vicissitudes of the Civil War, no doubt it would have been strong and powerful. The story of its demise will be found in the narrative for the year 1866. Apparently, there was no change in its officers after 1861. It was necessary that five members be present to constitute a quorum, and it is doubtful whether during the war years a quorum could be obtained. The rooms of the Academy were in French's Block on Third Street. French's Block was a three-story stone building on the north side about where the driveway to the Public Library now is. In 1860, George Benz' saloon occupied the ground floor. As far as is known, no new members were ever admitted to the Academy. There seems reason to believe that the Academy contemplated the erection of a building, for in 1864 a payment was made on a lot on Third Street. We may also regard the Academy as giving some instruction in medicine, as medical students were allowed the use of their library and laboratory under their preceptors. The Academy also fostered Dr. D. B. Reed's lectures on chemistry during his stay here in 1861 and 1862.

Medicine in Saint Paul since 1870

The collection of data relative to the history of medicine in Ramsey County previous to 1870 necessitated considerable research, as there was no local medical literature in our state except the reports of the State Insane Asylum.

In 1870, the publication of the transactions of our State Medical Society was begun and the publication of our first medical journal, *The Northwestern Medical and Surgical Journal,* by Dr. Alexander J. Stone of Saint Paul. The minutes of our Ramsey County Medical Society are also preserved. These sources of information, together with the files of medical journals established at a later date, the minutes of other local and state societies make the gathering of material for medical history from this time on a comparatively easy task. The writer feels the better plan of procedure from this time is to give a brief outline sketch of medicine in Saint Paul, and if a more detailed history is desired some other more gifted person should take up the task. For this reason no biographic sketches will be included, and men prominent in the Ramsey County Medical Society will be mentioned only by name. Biographic material may readily be found. The writer also will confine himself largely to the history of the Ramsey County

Medical Society, since all physicians of prominence were members of it. It is true that there was a local and a twin city homeopathic medical society, but the followers of that cult never occupied positions of any prominence in medicine, and the more progressive among them were glad of the opportunity to be rated as physicians rather than homeopathic physicians. Before taking up the Ramsey County Medical Society a few incidents of general interest, not directly concerned with that Society, will be mentioned.

In 1870, Dr. Alexander J. Stone began the publication of the *Northwestern Medical and Surgical Journal.* Four volumes of this monthly journal were published. In 1872, the journal passed from his possession to Dr. Harry C. Hand, of Saint Paul and Dr. H. H. Kimball, of Minneapolis. Publication ceased in 1874. In 1881, Dr. Jay Owens founded the *Northwestern Lancet,* a bi-monthly publication, which later passed into the hands of Doctor Stone. After some years, it was sold and finally taken to Minneapolis. It has had a continuous and prosperous career since its beginning. In 1870, Dr. Stone founded the Saint Paul School for Medical Instruction. This school was designed to furnish more adequate and varied preparatory medical instruction than the preceptor system then in vogue. No degrees were conferred. The first faculty and officers of the school were:

Officers

President—Samuel D. Flagg
Treasurer—Charles E. Smith
Secretary—Alex. J. Stone

Board of Instructors

D. W. Hand—Surgery
Samuel D. Flagg—Materia Medica, Therapeutics and Diseases of Children
William Richeson—Anatomy and Chemistry
Brewer Mattocks—Physiology, Hygiene and Medical Jurisprudence
Charles E. Smith—Principles and Practice of Medicine
Alex. J. Stone—Obstetrics and Diseases of Women

In 1871, H. C. Hand taught pathology and J. B. Phillips, chemistry. In 1879, this school became the Saint Paul Medical College which was at one time affiliated with Hamline University. Classes were graduated and degrees conferred. In 1888, this school and the Minnesota College Hospital of Minneapolis gave up their charters when the Medical Faculty of the University of Minnesota became a teaching body. The history of medical instruction in Minnesota will be taken up in another portion of this book.

An event of considerable importance to the medical profession took place in Saint Paul in 1874. The Legislature of 1874 passed an abortion law, largely at the instance of the State Medical Society. Unfortunately, the law provided that an antemortem statement made under the belief of impending death was absolute proof of commission of abortion. The first fruit of this law was the conviction on June 9 of Dr. Jay Owens, who it was alleged, induced a pregnant female to take a medicine known as "Clark's Female Periodical Pills," and abortion followed. Owens was not allowed to introduce any testimony whatever, and was sent to the state prison. In November, Cushman K. Davis, who was Owen's attorney, was elected Governor and his first official act when he took office the following spring was to pardon Owens. The Legislature of 1875 then amended the law so that "no conviction shall be had upon the uncorroborated evidence of the woman." The first law made conviction easy, the modification made it difficult. In most states, no special rule of evidence for cases where abortion is charged exists, but the ordinary rule of evidence prevails. At the May, 1892, meeting of the Ramsey County Medical Society, the subject of abortion was discussed and resolutions were passed to bring this matter before the State Medical Association at the meeting of that year, and to have the Association recommend to the Legislature the repeal of the law of special rule of evidence. The failure of the State Association to take action was probably due to the fact that many of the members felt that there was some personal animosity back of the attempt to change the law. At the time of his conviction, Dr. Jay Owens was associated with Dr. Alexander J. Stone. Doctor Owens, after his release from prison, continued to practice medicine in Saint Paul, and in 1886 was elected president of the Ramsey County Medical Society. He died on April 17, 1890.

About 1890, Dr. Walter Reed, U. S. A., was stationed in Saint Paul as surgeon of the department of the Dakotas. He and Dr. Louis B. Wilson, now of the Mayo Foundation and then a teacher in the Saint Paul High School, had a bacteriologic laboratory in the school. Doctor Wilson learned bacteriologic technic from Doctor Reed.

Regarding the various hospitals in Saint Paul, only St. Joseph's and St. Luke's existed prior to 1870. The history of their establishment has already been noted. St. Joseph's Hospital has occupied its present site since the beginning. St. Luke's Hospital was incorporated in 1855 and re-incorporated in 1866 under the name of the Christ Church Orphans Home and Hospital. It was then located at Park Place. In 1873, it was moved to the north side of West Fourth Street, west of St. Peter Street, and in the spring of 1874 a large house on the north side of Eighth Street, between Minnesota and Robert streets, was purchased from Mrs. Mary A. Robinson. The present site was occupied in 1892. Mrs. Mary A. Bradbury, who was matron of St. Luke's from 1880 to 1895, died in Los Angeles, California, on August 6, 1932, aged ninety-two years.

The Saint Paul Homeopathic Hospital was organized and located at 800 Agate Street in 1887. It had a short life. The Saint Paul Hospital was first known as Luther Hospital, and was founded by Dr. Edouard Boeckmann. This hospital has now passed out of existence.

The history of the other hospitals in Saint Paul may be found in Fifield's *American and Canadian Hospitals.* Various small and private hospitals have existed from time to time, but were and are of no importance.

(To be continued in June issue)

President's Letter

THE Minnesota State Legislature has adjourned. As individuals we may have been interested in many actions that came under consideration. As a group of doctors we were interested only in problems that involved the health of the people.

One reason why Minnesota is right at the top of all states in the Union in health is our past and present Legislative Committees, which have given us in more recent years the Basic Science Law and the Medical Practice Act, and which have consistently advocated beneficial health measures.

We have had many splendid men serving on our Legislative Committees throughout the history of the organization. John Armstrong's Historical Committee will testify to that. From the standpoint of practical achievement, however, a more positive era of health legislation began in recent years. Frank Savage served as chairman of the Legislative Committee for a period of time, also J. T. Christison and then W. L. Burnap, an unusually active president, secured the services of Herman Johnson. With Dr. Johnson were C. B. Wright, J. M. Hayes, S. H. Boyer, Charles Bolsta, F. J. Plondke, G. I. Badeaux, E. A. Eberlin. Space will not permit naming the entire list of faithful committee members through the terms of chairmanship of Drs. Savage, Christison, Johnson, and Sogge.

L. L. Sogge, our present chairman, had his training under Dr. Johnson and was with him from the start. The committee under his leadership has carried on as ably as if Dr. Johnson were living. Dr. Johnson, himself, always gave great credit for the success of the committee's work to Mr. F. Manley Brist, our legal adviser. In this he has been most strongly joined by Dr. Sogge and by all who know of Mr. Brist's fine work for the medical profession of Minnesota.

On May 31 the State Medical Convention will open with an excellent scientific program, a valuable public health exhibit, an unusual program of economics and a surprise entertainment by the Hennepin County Medical Society. Every member should arrange to attend this meeting.

George Earl, M.D., *President,*
Minnesota State Medical Association.

EDITORIAL

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BUSINESS MANAGER
J. R. Bruce

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ORTHOSTATIC HYPOTENSION: DIFFERENTIAL DIAGNOSIS AND TREATMENT

MAN is enabled to assume the upright position because he is endowed with a delicate mechanism for adjusting his blood pressure to offset the hydrostatic effect of change in posture. This function of circulatory homeostasis is mainly a protective mechanism intended to prevent deprivation of oxygen of the central nervous system. The circulatory correction is accomplished through vasoconstriction and cardiac acceleration.

Orthostatic hypotension is a clinical syndrome in which the usual compensatory mechanism does not function efficiently; consequently, with change to the upright position there is a marked decrease in systolic and diastolic blood pressure, resulting in cerebral anoxemia. The syndrome of orthostatic hypotension was first described clearly by Bradbury and Eggleston in 1925. They used the term "postural hypotension." However, the term "orthostatic hypotension" as suggested by Laubry and Doumer, seems preferable since it indicates the bodily position in which the hypotension occurs. Since 1925, about forty cases of the condition have been reported in the literature.

The exact nature of the failure of vasomotor control in orthostatic hypotension is as yet unknown. Because of the associated symptoms indicating dysfunction of the sympathetic nervous system (particularly hypohidrosis or anhidrosis and failure of normal cardiac acceleration), it is thought that the fault is in the sympathetic nervous system. The characteristic features of orthostatic hypotension are (1) a marked decrease in systolic and diastolic blood pressure on assuming the erect position, resulting in weakness or syncope; (2) localized or generalized hypohidrosis or anhidrosis; (3) failure of the normal compensatory increase in pulse rate on assuming the upright position; (4) increased distress of the patient during hot weather; and (5) secretion of larger amounts of urine in the recumbent than in the upright position.

The differential diagnosis of this condition involves separating it from other types of syncope, particularly simple syncope, syncope referable to sensitivity of the carotid sinus, syncope associated with hypersensitivity to cold, heart block, hypoglycemic reactions, and seizures of petit or grand mal. The presence of a postural hypotension should be suspected if the patient complains of weakness or syncope only after change to the upright position or after standing for a short time. The differential diagnosis is simplified by taking the patient's blood pressure in the recumbent and standing positions and demonstrating the presence or absence of a marked orthostatic decrease in blood pressure. The presence of hypohidrosis or anhidrosis and the failure of cardiac acceleration will differentiate orthostatic hypotension from simple syncope and the syncope which follows prolonged rest in bed, in which conditions there also may be an orthostatic decrease in blood pressure. The syncope caused by hypersensitivity to cold is accompanied by a decrease in blood pressure which is not directly related to posture. The history or demonstration of urticarial swelling of the skin when the patient is exposed to cold will readily differentiate the syncope of hypersensitivity to cold from the syncope of orthostatic hypotension.

In the syncope of hypoglycemic reactions, of sensitivity of the carotid sinus, of heart block, or of petit mal seizures, the postural features of the syncope will not be prominent and the characteristic signs of these conditions, i.e., low fasting blood sugar, a hypersensitive carotid sinus, and electrocardiographic changes or electroencephalographic changes, can be demonstrated.

The treatment of orthostatic hypotension is directed toward the maintenance of the blood pressure above the level which produces symptoms. Those drugs which produce vasoconstriction have been the ones most commonly used. Among those reported to have been used with success are ephedrine, benzedrine, paredrine[3,4] (beta-parahydroxyphenylisopropylamine), ergotamine tartrate, neosynephrine hydrochloride[5] (levo-metahydroxy-phenyl-ethanol-methylamine hydrochloride) and pitressin (the pressor principle of the posterior lobe of the hypophysis).

It is of interest that none of the drugs used for the treatment of orthostatic hypotension are very effective in preventing the orthostatic decrease in blood pressure. They alleviate the symptoms by elevating the general blood pressure, so that when the orthostatic decrease does occur, the lowest pressure reached is still above the point where weakness or syncope would be produced. In this respect, the situation is the reverse of that obtaining in some cases of essential hypertension, in which the administration of certain vasodilating drugs will maintain the blood pressure at a lower level, but will not prevent the same range of reaction of the blood pressure to stimulation. Ephedrine has been the drug usually chosen for the treatment of orthostatic hypotension. However, paredrine hydrobromide and neosynephrin hydrochloride are reported to produce equally as good results as ephedrine without the undesirable accessory reactions caused by ephedrine. The undesirable accessory effects of ephedrine and benzedrine are nervousness and insomnia. The patient having orthostatic hypotension usually can tolerate larger doses of ephedrine than can other persons, and relatively large amounts of this drug may be administered without producing unpleasant accessory effects. The best drug to use and the amount of it required are individual questions; the treatment must be adjusted to the patient. Some of these drugs may stimulate sweating sufficiently. If the anhidrosis is especially annoying, pilocarpine hydrochloride may be administered by mouth.

E. A. Hines, Jr.

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THE BARBITURATES AND LEGISLATION

THE last Minnesota State Legislature passed a law, similar to those already passed by some sixteen other state legislatures, limiting the sale of barbiturates to the public on prescription only. As far as the medical profession is concerned, the usual rules for the writing of a prescription apply; refills are not allowed without written or direct verbal authority from the prescriber. Physicians may be thankful that the inconvenience of writing refill prescriptions has been eliminated by legislation. This should make full coöperation on the part of the profession assured.

Although most physicians have encountered instances of the abuse of barbiturates, the article by Hambourger* must have been a revelation to many. It seems that at the meeting of the House of Delegates of the A.M.A. in June, 1937, a resolution was introduced on the evils resulting from promiscuous use of barbituric acid and derivative drugs. The resolution included the statement that "The evils of these drugs include habit formations, toxic cumulative action, their substitution for alcoholic beverages for drunken episodes, their use for successful, as well as unsuccessful, suicidal attempts, their improper use being a recognized causative factor in many motor accidents and their improper use being a recognized etiological factor in some criminal assaults. . . ." The report by Hambourger was limited to the phase of the use of barbiturates for suicidal intent and was published for the Council on Pharmacy. Some of the author's disclosures are startling and emphasize the need for legislation.

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*Hambourger, W. E.: A study of the promiscuous use of the barbiturates. Jour. A.M.A., 112:1340, (April 8) 1939.

According to this author, more than 1,200,000,000 grains of barbiturates were sold in the United States in the year 1936. This, because of high United States duty, practically represents consumption in this country. What percentages are sold by druggists over the counter, dispensed by prescription, used for psychotics or for basal anesthesia, is unknown. At any rate, the total amount is much too much. United States Census Bureau figures show that in the five-year period, 1932 to 1936, inclusive, there were 634 suicides in the United States attributed to barbiturates—4.2 per cent of all suicides from poison. In 1936, 171 suicides were due to the barbiturates; 165 more classified as accidental deaths due to the barbiturates. It is, therefore, conservative to estimate some 300 suicides during 1936 from this cause. The number has probably increased since 1936.

The possession of large quantities of barbiturates is dangerous and should be classed with the possession of firearms. Either one being on hand is too convenient to use with suicidal intent during emotional upsets. There are probably as many unsuccessful as successful attempts at suicide by this means. Fully as serious a phase of the abuse of the barbiturates is the mental derangement reported at times from their habitual use. It would be instructive to know how many automobile accidents or criminal assaults are attributable to their use.

The medical profession has doubtless been to some extent responsible for the present vogue in sedation. Much of the need for sedatives could be avoided by a sensible restriction or elimination of stimulants such as coffee and nicotine. A realization of the enormous amount of barbiturates consumed should assure the coöperation of the profession in an attempt to reduce the use of these valuable drugs by careful prescribing.

LEGISLATION REGARDING BARBITAL

There is published herewith the complete text of the law enacted by the 1939 Minnesota Legislature on the subject of barbital, the derivatives of barbituric acid, and preparations containing such substances. This law was sponsored in the Senate by Senator Wahlstrand of Willmar and Senator Oliver* of Graceville. In the House of Representatives it was introduced by Representatives Paige of Minneapolis, Eklund* of Duluth and the late Dr. Lowe of Pipestone.

Much credit is due Senator Wahlstrand for the passage of this law. His interest was due to the abuses attending the unrestricted sale, in drug stores, to children and barbiturate addicts of these various preparations. Senator Wahlstrand stated he had no desire to impose restrictions on the ethical practitioner of medicine and publicly commended the Minnesota State Medical Association for their assistance in drafting and passing the law. The law requires no special permits on the part of physicians nor does it call for any fee. It simply states that a physician must act "in good faith" in the prescribing, administering and dispensing of barbital. Drug stores, however, cannot sell barbital, as defined in the act, except on the prescription of a physician, dentist or veterinarian, as the case may be.

Every member of the Minnesota State Medical Association is urged to read this law, and particularly the provisions in reference to writing prescriptions. Remember! they cannot be refilled without your *consent*. The authors of this law are your friends—the measure is a public health act—do your very best to comply with it and to help in its enforcement.

Committee on Public Policy,
Minnesota State Medical Association,
L. L. Sogge, M.D., *Chairman*.

An Act

Regulating the Sale, Gift, Order, Exchange, Distribution and Possession of Barbital, Barbituric Acid, Its Compounds and Derivatives, and Providing Penalties for Its Violation.

Be It Enacted By the Legislature of the State of Minnesota:

Section 1. It shall be unlawful for any person, firm or corporation to have in his, or its, possession, or to sell, give away, barter, exchange or distribute barbital, except on a written prescription of a doctor of medicine, doctor of dental surgery, or doctor of veterinary medicine, lawfully practicing his profession in this state.

Section 2. For the purposes of this Act, the word "barbital" means: barbital and any derivative thereof; diethylbarbituric acid; any alkyl, aryl, metallic or halogenated derivative of barbituric acid; veronal (barbitone); proponal; ipral; dial; neonal (soneryl); sandoptal; amytal; phenobarbital (luminal); phandorn; noctal; allonal (which contains allylisopropyl-barbituric acid in combination with amidopyrine); medinal; any preparation, mixture or other substance containing any of the foregoing substances.

Section 3. No person other than a licensed pharmacist, shall sell barbital, and then, only as provided in this act.

Section 4. For the purposes of this act, a prescription for barbital is void unless (1) it is written in ink and contains the name and address of the person for whose use it is intended; (2) it states the amount of barbital to be compounded or dispensed, with directions for its use; (3) it contains the signature and address of the prescriber, and a designation of the branch of the healing art pursued by the prescriber, and (4) it shows the date when signed by the prescriber. Every licensed pharmacist who compounds any such prescription, shall at that time, mark it in ink so as to show that it has been compounded, and the date thereof, and he shall retain such prescription in a separate file for a period of not less than two years, open to inspection by any officer of the state, county or municipal government, whose duty it is to aid and assist with the enforecment of this act. No such prescription shall be refilled, except with the written or verbal consent of the prescriber, provided that the date of such consent must be recorded, in ink or indelible pencil, upon the original prescription by the pharmacist who refills the said prescription together with the name of said pharmacist, and provided further, that in event of verbal consent it must be direct from the prescriber to the said pharmacist. Every such pharmacist shall distinctly label the container with the directions contained in the prescription for the use thereof, and the following warning: *"Use Only As Directed."*

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*Physicians.

Section 5. (1) A licensed doctor of medicine, or a licensed doctor of dentistry, in good faith, and in the course of his professional practice only, may prescribe, administer, and dispense barbital, or he may cause the same to be administered by a nurse or interne under his direction and supervision.

(2) A licensed doctor of veterinary medicine, in good faith, and in the course of his professional practice only, and not for use by a human being may prescribe, administer, and dispense barbital, and he may cause the same to be administered by an assistant under his direction and supervision.

(3) Nothing in this act shall prohibit the sale to, nor the possession of, barbital, by wholesale drug concerns, registered pharmacies, licensed pharmacists, licensed doctors of medicine, licensed doctors of dentistry, licensed doctors of veterinary medicine, or any bona fide hospital or other bona fide institutions wherein sick and injured persons are cared for or treated, or bona fide hospitals wherein animals are treated.

Section 6. Any person, firm or corporation that violates any provision of this act shall be guilty of a gross misdemeanor, and upon conviction thereof, shall be punished by a fine of not to exceed $1,000 or imprisonment in the county jail for not to exceed one year or by both such fine and imprisonment.

Some of the preparations regulated under Section 4 of the Barbituric Law and which now must be dispensed only with a doctor's prescription written in ink are as follows:

Amytal Tablets
Amytal Elixir
Amytal Compound Capsules
Amytal C Acetylsalicylic Acid
Amytal & Ephedrine Capsules
Amytal & Theamin Capsules
Amytal Sodium Capsules
Amytal Sodium Suppositories
Amytal Sodium Ampoules
Epragen Capsules
Barbital Tablets
Allonal
Arlcaps
Alurate
Amidopyrine & Phenobarbital
Aminophyllin & Phenobarbital
Adalin Luminal
Amidoneonal
Kres-Lumin
Luminal Tabs.
Luminal Elixir
Luminal Sodium Tablets
Luminal Sodium Ampoules
Barbitone
Bellergal
Belladenal
Barbella
Calcidrine Syrup
Cibalgine
Dial
Evipal
Evicyl
Epharbital
Ephedraphen
Iocapral
Ipral Calcium
Ipral Sodium
Ipral Elixir
Ipral Aspirin
Ipralidon
Mebral
Medinal Tablets
Neonal Tablets
Neonal Compound
Neonal Elixir
Nembutal Capsules
Nembutal Elixir
Nembutal Suppositories
Nembutal & Aspirin
Ortal Capsules
Ortal Combinations
Peralga Tablets
Penobarbital
Pentabarbital Sodium Capsules
Theodiatal Capsules
Tedral Tablets
Thebital Tablets
Theominal Tablets
Veronal
Dialacetin
Lumalgin
Lumodrin
Nembutal & Ephedrine Capsules
Novasural
Ortal Sodium Capsules
Ortal Ampoules
Phanodorm Tablets
Phenobarbital Sodium
Pentabarbital Sodium Suppositories
Sedabarb
Sedaphen
Theobromine Compound Tablets
Ethobral Tablets
Veronal Sodium
Ephatal Capsules

SAL TRAG FOR ARTHRITIS

As an herb remedy for arthritis, called Sal Trag, is being offered to the local profession, the following information may be of interest:

In June, 1924, the Federal Trade Commission at Washington reported that Sal Trag and Nue-Ovo were practically the same product. Sal Trag is the name given this remedy of secret composition when offered to the profession, and Nue-Ovo is the name given when it is sold to the public. Sal Trag is probably more concentrated. In 1929, the Food and Drug Administration reported in a notice of judgment that Nue-Ovo was misbranded because it was being sold under false and fraudulent therapeutic claims. At that time, the federal chemists declared that the preparation was a brown watery solution of extracts of plant drugs, including a laxative drug, a bitter drug, resin, saponin and caffeine, colored with caramel and preserved with sodium benzoate.

There is at least one report of a severe inflammation of both eyes, with a residual visual defect in a woman who had taken Nue-Ovo for arthritis. It is dangerous and not good practice to prescribe drugs of unknown composition, or containing ingredients, the action of which is not known.

Oral Pollen Preparations

Early last year the Chicago Society of Allergy issued a note of warning in reference to the use of oral pollen preparations, not only because of the probable numerous disappointments which might occure following the use of oral pollen preparations but also because of the possible dangers inherent in any new and unproved method of treatment. In *The Journal,* March 25, 1939, appears a new communication from the Chicago Society of Allergy. The Society is to be commended for its stand against the exploitation of a product for oral administration in the treatment of hay fever which may be not only beneficial but a decided economic loss to the patient. The difficulty of regulating dosage because of the difference in rate of absorption from the gastrointestinal tract alone is a serious objection to this mode of therapy. It will require considerable evidence to show by passive transfer work that pollen is absorbed in the doses intended. The Council on Pharmacy and Chemistry of the American Medical Association has accepted no pollen preparation proposed for oral administration. *(J.A.M.A.,* March 25, 1939, p. 1159).

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
W. F. Braasch, M.D., Chairman

HOW SHALL MEDICAL CARE BE IMPROVED?

NO ONE would deny, least of all physicians, that medical care of the people of our country can and should be improved, but there is vast divergence of opinion as to how that improvement can be brought about.

Representatives of one school of thought reiterate the unverified and unverifiable statement that a third of our population receives inadequate medical care. This viewpoint seems to imply that the percentage of the population which receives inadequate medical care is immeasurably greater than it was in times past. Anyone whose experience covers a period of three or four decades knows emphatically that this is not the case. The innumerable projects to which physicians have given their services, including dispensaries, sanitariums, hospitals for crippled children and programs for prevention of communicable diseases have resulted in much wider and more effective distribution of medical care than formerly was available. The conquest of communicable disease, the constantly falling death rate from tuberculosis and the increasing span of life attest the efficacy of these services and denote an achievement that exempts the medical profession from a charge of incompetency, to say the least.

The list of achievements is long. What would life be today without vaccination for smallpox, immunization against diphtheria, antidiphtheritic serums, insulin, liver extract for pernicious anemia, antipneumonococcus serums and, lately, sulfanilamide and sulfapyridine, to mention only a few agents and methods for control and cure of dreaded diseases?

Shrewd Gesture

It is a shrewd political gesture to proclaim the urgent need for wider distribution of medical agents and services. In like manner politicians have found it wise to declare for ham and eggs every Thursday or for the Townsend plan, to secure their election, without any great concern about a source of revenue to finance such schemes or indeed, one suspects, without any serious intent of supporting such harebrained proposals after their election. If one opposes the Government's plan to secure a wider distribution of medical care, though subscribing to the worthiness of the objective, one is labeled a reactionary and accused of lack of humane instincts.

The fundamental reason the medical profession is opposed to socialized medicine as proposed by the present administration is its instinctive surmise that it has a political motivation. Those who compose the public are asked to accept the Government's apparent solicitude for their health as a purely altruistic gesture in no way related to their vote in the coming election. They are asked to forget that in one more respect the Federal Government will reach down and regulate one of their most precious prerogatives, namely, their relation with their physicians. They are asked to believe that appointments of physicians to care for their health will be based solely on competency, rather than on the basis of political expediency. They are asked to forget that bureaucracy in medicine is no different than it is in any other field, devouring too large a measure of their funds designed to provide for their medical care.

Only the Husks

The same public is asked to believe that a physician in a more or less regimented system will have the same incentive to make medical discoveries, to advance his medical knowledge, or to treat each patient with the same degree of thoroughness as he would if the present competitive practice based on free choice of physician existed. In a system of medical care dominated by governmental regulation, the citizen is likely to wake up to find that he has sold his medical birthright for a mess of governmental pottage and to learn that he is receiving only the husks of medical care.

This is not to deny the need for adapting medical practice to changing medical needs. The medical profession is progressive and believes in the necessity of continual growth and adaptation. But it has a few fundamental beliefs as to the way those changes should be made. It believes that the change must be evolutionary and not revolutionary, if colossal mistakes are to be avoided. It does not believe that there is any substitute for local administrative responsibility for securing efficient medical services adapted to local needs. It believes that as a body it is better qualified than any other group of people to formulate plans for improvement of medical care in its own community, that it must have a vital part in the executive policies controlling any effective health program and, finally, that the freedom of a patient to select the physician of his choice is essential to any plan of governmental assistance in medical care and is an inalienable right of a patient in a free nation.

Profession Will Coöperate

I am sure that the medical profession will gladly coöperate with the Government in a program of better medical care that is based on these principles. Unless we have lost our faith in local self-government these principles are sound and are in keeping with the ideals on which our democracy is founded.

W. F. B.

EXPERIMENTS IN MEDICAL SERVICE

The leaven of reform is working in the ranks of medical organizations much as the New Deal politico-sociologists had hoped and planned. Propaganda has put across the grossly exaggerated claims of lack of medical care on public opinion and the politicians now are watching results. Believing that there is a popular demand for sickness insurance and in order to stop legislative demands, various state and local medical societies either have or are about to propose plans for sickness insurance. Spurred on by the apparent success of group hospital insurance, somewhat similar methods are being applied to medical care. Any plan which would permit of an equable distribution of the costs of illness among patients and which would not alter the present system of medical practice would seem worth striving for. With this purpose in view, voluntary methods of sickness insurance are being offered to the public in many sections of the country. This in spite of the warning issued by most economists that voluntary systems of health insurance are doomed to failure and invariably lead to compulsory insurance.

How are these plans working out? It is, of course, too early to make any definite observations but difficulties are already developing to plague the sponsors. For instance, the health service system of medicine adopted in one large city, which started out bravely over a year ago, offering health care at bargain rates, gives evidence of having serious difficulties. The unit system of reimbursement for medical services rendered which was originally evaluated at $1.00 is now reduced to about 18 cents. In other words, the overhead administrative costs have increased to such extent that the reduced net income leaves very little for the doctor. This is only one of many other unforeseen difficulties. The latest is that the drugless practitioners are insisting upon being added to the professional staff and, being a semi-public project, their demands have a good chance of being adopted.

Minnesota Is Fortunate

As Dr. C. B. Wright recently emphasized before members of our state medical society, no plan of unproven economic value which is being promoted for the purpose of preventing the legislative adoption of another plan is on a sound basis. There are too many factors which are bound to cause trouble in the plans which have been proposed so far.

We physicians in Minnesota are indeed fortunately situated. In the first place we have a well-trained profession, who are practicing good medicine to the satisfaction of the majority of the people. They have been most generous in giving medical care to the sub-economic groups and have made many sacrifices in these uncertain times. They believe that the present methods of distributing medical care will prove to be the best in the long run for all concerned. The great majority of the people of the state have not been greatly influenced by federal propaganda so far, because they mistrust governmental medicine.

Our Courageous Colleagues

Let us then continue to remain as observers of the very interesting spectacle of federal efforts to force sickness insurance on the public on one side and on the other side watch the courageous efforts of our colleagues in various parts of the country charting the unknown seas of medical distribution. Let us be open-minded, however, and if any sound improvement on our present system proves to be worthwhile, by all means consider it. Slow and well considered evolution in the delicately balanced institution of medical practice would seem to be a logical course. In the meantime, let us concentrate on improving our methods of practice by systematic efforts to enlarge our knowledge of medicine. This is the best answer to public dissatisfaction.

W. F. B.

NEW CHOICE OF VENDOR CLAUSE

Many legislative enactments of great interest to physicians marked the notable 1939 session just concluded.

Among them is the Barbital Law commented upon elsewhere in this issue of MINNESOTA MEDICINE. The Reorganization Law is also of special interest to physicians on two accounts. First, it puts the administration of all services involving medical care to relief clients and to recipients of social security aids in one department under one directing head. Thus the ground work is laid for elimination of long standing duplications, misunderstandings, over-lapping and gaps in services. Second, it maintains the former status of the State Board of Medical Examiners as an independent board, independently supported by fees of licensed physicians. The original provisions of the bill called for a tax on the funds of all boards and likewise gave the administrator power to consolidate and otherwise regulate them. Long experience with this board as it has functioned under Minnesota's model basic science legislation and medical practice act has shown the wisdom of maintaining it as a self-sustaining agency.

Law Clarified

Of immediate personal importance to every physician in the state is the new choice-of-vendor clause which was restated in the new relief law with a clarifying phrase which should end any further discussion as to its applicability to the services of the physician. As the law now reads the relief client is specifically guaranteed his choice-of-vendor for *services and supplies.*

The choice-of-vendor clause as written in the 1936 law ushered in a new era in the handling of medical relief in Minnesota. Whereas there had been free choice of physician for the indigent in a few counties before 1936, many other counties still retained the county physician system of care for the sick poor and his legal status was unquestioned.

Discussion: Complaints

With the new law and the subsequent interpretation of the Attorney General which definitely placed the physician as a vendor within the meaning of the law, the county poor physician became a thing of the past in all the counties that accepted state aid.

The question remained an issue, however, with county commissioners and welfare boards questioning the interpretation of the Attorney General in several quarters. Lively discussion of the merits of the free-choice-of-physician system have marked several county welfare board conferences of late and complaints have been voiced concerning the cost.

Trust Merited

The action of the legislature in clarifying and strengthening the choice-of-vendor clause, in the face of these discussions, constitutes a double reassurance to the physicians. It indicates first that the rights of the individual are still regarded as important rights by Minnesota legislators. It indicates, also, the trust which is reposed in the medical profession in Minnesota. This trust has been well justified, not only during the relief years but over all the years when the physician alone shouldered the burden of the sick poor in his locality with occasional and uncertain aid from the authorities.

It goes without saying that members of the Minnesota State Medical Association will cooperate heartily with county welfare boards to continue to merit that trust and to keep medical costs as low as possible in these difficult years of relief financing.

FOR A STUDY OF SEX CRIME

The bill providing for the apprehension of potential sex criminals was regarded by its sponsors and by both branches of the legislature as a preliminary step, only, in the control of the problem of sex crime.

The Minnesota State Medical Association and the Minnesota State Bar Association were named jointly by the House Judiciary Committee which recommended passage of the bill as "technically equipped to make invaluable recommendations towards the solution of this problem."

A resolution requesting that the State Bar Association and the State Medical Association appoint committees from each body to study the subject of psychopathic personalities and also that the committees so appointed transmit a report of their findings as well as their recommendations to the governor and to the House of Representatives at the beginning of the legislative session of 1941 was passed by the committee and subsequently transmitted to the secretary of the association.

These reports will be utilized to formulate further and additional legislation to cope adequately with this problem.

The request of the House Judiciary Committee will be presented to the Council of the Association at the annual meeting, May 31, June 1 and 2, in the Minneapolis Auditorium.

DIFFICULTY IN DULUTH

A new fee schedule with regulations and instructions has just been issued by the St. Louis County Welfare Board. After many years of close coöperation between physicians and welfare board in St. Louis County, this schedule has aroused a just resentment among those who have assisted in making St. Louis County the envy and admiration of many other localities in the state for the smoothness and efficiency of its system.

"It is the desire of the County Welfare Board," say the new instructions, "to maintain the contact of the private physician with his former patients who may now be county charges, but at the same time it expects the private physician to render dependable service and to *continually bear in mind the fact that it is the taxpayers' money that is being spent.*" Well, there are over a hundred physicians referred to in this community who are some of the taxpayers. They have been taking care of these people, who are now charges, down through the years, through good times and bad. Without a Welfare Board to watch over them and to tell them what it "expects" of them, physicians have rendered dependable service to these patients who are now, perhaps temporarily, receiving county aid. It sounds like a play of words to impress the public and also a bit dictatorial. Following the preamble quoted above, some of the absurdities of a fee schedule are listed such as "collarbone fracture, $7.50" and "clavicle fracture, $25.00; nose fracture, $12.50" and "nose broken, $37.50," all of which suggests that physicians, "expected to render dependable service," were not consulted in the formulation of the fee schedule.

A. N. C.

"AIM: TO SAVE LIVES"

The effectiveness of the 1939 Co-Ordinated Medical and Public Health Program is measured to some extent by the response and coöperation it has evoked from Minnesota newspapers.

No newspaper has shown more intelligent interest in medical news and in public health education in general than the *Minneapolis Journal*. The editorial printed below appeared on Monday, April 3. It is reprinted here as evidence both of the coöperative spirit of the *Journal* and of the effectiveness of this new program:

> ### Cancer Prevention
>
> Time is an all-important factor in the arresting of any serious disease, and in none is early treatment more important than in cancer. For this scourge creeps up stealthily, like a thief in the night, and its early symptoms seldom cause alarm.
>
> The State Medical Association is carrying on an educational campaign this month, to save lives from cancer. The disease caused 3,775 deaths in Minnesota last year, and was second only to ailments of the heart in fatalities. The job the medical men are undertaking is to make older persons conscious of the danger of cancer, so they will not hesitate to have diagnoses made whenever there is cause to suspect approach of the disease. Better still would be periodical check-ups. Physicians say that not more than 15 per cent of cancer cases are discovered in time for effective treatment. Given an earlier detection of cancer, fully half the deaths from this disease could be prevented.

The Women's Field Army Against Cancer, now conducting a membership drive, has the same purpose as that of the physicians. Both organizations are trying to overcome the foolish reluctance of so many persons to give the doctor a chance—to head off fatal illness by going to him in time. The efforts of these organizations deserve support and appreciation. Their aim is to save lives.

KNOW YOUR DRUGS

(Monthly Editorial Prepared by the Medical Advisory Committee)

From time to time your Medical Advisory Committee has brought to the attention of the members various conditions, arising in the treatment of patients, that are being used by these patients as reasons for bringing action in court against our membership. In the last months numerous cases have arisen from alleged malpractice in the use of the injection methods of treatment, the use of sclerosing injections in varicose veins, hemorrhoids, and hernias, the injection of serums without first finding out the reactions of the patient to such serums, the injections of the salts of arsenic and salicylates as well as other well known remedial agents.

Knowing this, it is well to remember that normal tissues can be harmed by these solutions and that some people are particularly allergic even to the smallest amount of some drugs.

It behooves the man making these injections and giving these treatments, therefore, not only to have a firm groundwork in the fundamentals of this method, but to be sure of the purity and accuracy as to dosage of the drug used, as well as the ability and financial standing of the manufacturer to back up any claims which they may make for the drug. Unscrupulous manufacturers are making extravagant claims which have no foundation in fact. You can well be made the unwilling victim of these claims.

In this day and age the best is still none too good. Know your drugs and know how and when to give them.

B. J. B.

CONFERENCE SPEAKERS

Speakers who are scheduled to participate in the Conference on Medical Problems which occupies the final day's sessions, Friday, June 2, of the 86th Annual Meeting at the Minneapolis Auditorium, are authorities in their fields. All are making definite contributions to the solution of medical and public health problems in America.

Gen. C. E. Waller of the United States Public Health Service is Surgeon-General Thomas Parran's right hand man in Washington and in the field. He is one of the key men in the program of the public health service.

Dr. F. W. Jackson of Winnipeg has been deputy minister of health of Manitoba (the minister, himself, is an elected official and a layman) for many years. He has watched the development of Canada's experiments with new technics of medical service and he has officially represented the medical profession in this development.

Mr. J. G. Crownhart, secretary of the Wisconsin State Medical Society, has made one of the most important contributions of our time to American knowledge of socialized and state medical systems in Europe. He is also leading his organization in a fight against the corporation income tax which may be of the utmost importance to every state medical association in the United States. The Wisconsin society won its initial legislative battle in a state skirmish for socialization of medicine in the Wisconsin legislature last year.

The Rt. Rev. Monsignor M. F. Griffin of Cleveland is Senior Trustee of the American Hospital Association and an active official in the Catholic Hospital Association, powerful defender of private and voluntary investment in our system of care for the sick.

Mr. J. A. A. Burnquist, attorney general of the State of Minnesota, is also a former governor of the state and exceptionally well qualified to talk on the history and character of Minnesota's legislation for care of the sick poor.

Dr. F. Stuart Chapin is chairman of the Department of Sociology of the University of Minnesota, director of the graduate school of social work and a nationally recognized authority on social needs and social problems, among which the problem of distribution of medical care has loomed large as a result of events of the last few years.

In addition to these guest speakers, Dr. W. A. O'Brien, the association radio speaker, and President George Earl, will be present to represent Minnesota physicians, with Dr. Frank Savage of Saint Paul, and Dr. W. F. Braasch of Rochester, as presiding officers.

The program is unique, the conference the only one of its sort to be held this year by any state medical association. Every physician in Minnesota should make it a special point to attend.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Mankato Physician Enters Plea of Guilty

Re: State of Minnesota vs. Arthur W. Eckstein, M.D.

On April 8, 1939, Arthur W. Eckstein, M.D., of Mankato, Minnesota, entered a plea of guilty to an information charging him with the crime of abortion committed on or about October 15, 1938, in the city of Mankato. Dr. Eckstein was also arraigned on a previous conviction (1934), and at the conclusion of which he was sentenced by the Honorable Harry A. Johnson, Judge of the District Court, to a term of not to exceed four years in a state penal institution. The Court was advised by legal counsel for the defendant that Dr. Eckstein's license to practice medicine had been revoked by the Minnesota State Board of Medical Examiners on December 16, 1938, for procuring, aiding and abetting a criminal abortion. Counsel also stated that Dr. Eckstein was employed by a wholesale pharmaceutical house of Milwaukee, Wisconsin, and that he was engaged in sales work for that concern in the eastern half of Iowa. Following a lengthy plea by Dr. Eckstein's lawyer, the Court suspended the sentence and placed Dr. Eckstein on probation in charge of the State Board of Parole. The Court warned Dr. Eckstein that in 1934 he had served a sentence in the State Prison for a similar offense, and that any violation of his probation, would result in his having to serve the entire sentence.

Dr. Eckstein was born at New Ulm, Minnesota, December 8, 1888. He graduated from the Medical School at Northwestern University in 1912. He was first licensed in Minnesota, by examination, in the same year, but had his license revoked in 1934, following his pleading guilty to a similar offense. Despite the fact that he was permitted, upon his release, to take the medical examination for a new license, and was subsequently granted a license, he again became involved with the law over the performing of a criminal abortion, resulting in the present criminal charge and the revocation of his license by the Medical Board on December 16, 1938.

OF GENERAL INTEREST

Dr. and Mrs. Daniel A. MacDonald left April 30 on a European trip. They will return July 1.

* * *

Dr. R. E. Cooper is the newly-elected school board member of the community at Sauk Center, Minnesota.

* * *

Dr. C. F. Wohlrabe, formerly of Minneapolis, has taken over the practice and hospital previously attended by Dr. M. H. Larson, at Nicollet, Minnesota.

* * *

Dr. S. D. Wolsztajn, who was previously associated with Dr. O. Daignault at Benson, has opened an office in Minneota for the practice of medicine.

* * *

Dr. A. F. Dworak is now practising medicine and surgery at Rosemount, Minnesota, where he opened offices in the Geraghty Building on Monday, April 17.

* * *

Dr. David Gaviser has recently associated himself with Dr. R. F. Werner, of International Falls. Dr. Gaviser was formerly on the staff of Minneapolis General Hospital.

* * *

Dr. Lynn Hammerstad, Windom, Minnesota, recently was appointed by federal authorities to serve as federal medical examiner of students registering for courses in aviation at the University of Minnesota.

* * *

Dr. Robert B. Tudor, of Minneapolis, joined Dr. J. F. Cumming of Morris, Minnesota, the first of April, in the practice of medicine. Dr. Tudor has come to Morris after serving interneships at several hospitals in the Twin Cities.

* * *

Motion pictures, through the courtesy of General Electric Company, were shown at the meeting of the Rice County Medical Association held April 5 in the Faribault Clinic Rooms. The movies portrayed the electro-cardiographic process.

* * *

Dr. P. J. Bursheim, who for some time past has been in the retail drug business at Atlantic, Iowa, has resumed his practice of medicine in the community of Exira, Iowa. Prior to his entering the drug business, Dr. Bursheim served the community of Lake Benton, Minnesota, as physician and surgeon.

* * *

Charles Bishop Will of Bertha, Minnesota, received his degree of Doctor of Medicine at the early spring commencement held recently at the University of Minnesota. For the past year, Dr. Will has been serving an interneship at Saint Luke's Hospital in Duluth. He will practice medicine at Ladysmith, Wisconsin.

* * *

Dr. M. G. Franta, Sauk Center, Minnesota, was appointed in March to take applications from young men who wish to enter one of the camps provided by the federal government for young men from the ages of 17 to 24 years. Dr. Franta's title in this capacity is chairman of the Seventh Corps Area, Citizens' Military Training Camps.

* * *

Dr. Gerald Taylor Evans, Assistant Professor of Physiological Chemistry, Yale University, has been appointed Associate Professor of Medicine and Director of Chemical and Metabolic Laboratories, University Hospital, University of Minnesota. Dr. Evans received his M.D. degree from McGill University in 1929 and his Ph.D. in Medicine from the University of Pennsylvania in 1936.

* * *

After more than forty-four years of service, Dr. G. E. Vaughan, of Winnebago, has made known his intention to retire from the practice of medicine. He has removed his offices from the Germain Building in Winnebago, to his residence, where he will care for those patients who especially wish him to attend them in their illness. He expects to have withdrawn entirely from active practice by next fall.

* * *

"Polypoid Disease of the Colon" is the title of Dr. R. F. Hedin's prize-winning essay which won for him the sum of $250.00, awarded by the Chicago Surgical Society for his report on original clinical investigative work. The paper will be presented before the Chicago Surgical Society on May 5. Dr. Hedin, who has been doing graduate work in Chicago, will return this summer to Red Wing to resume his practice.

* * *

The Saint Paul Surgical Society was host to prominent physicians from Chicago, Milwaukee, Duluth, Rochester, and Minneapolis, at its annual dinner on Thursday evening, April 13, in the Minnesota Club. Dr. Loyal Davis, professor of surgery at Northwestern University, Chicago, and well-known writer of medical treatises, was principal speaker of the occasion. Dr. W. C. Carroll is president of the Saint Paul Surgical Society.

* * *

Drs. George A. Earl and Everett K. Geer were principal speakers at the regular monthly meeting of the Washington County Medical Society held Tuesday evening, April 11, in the society's club rooms at Stillwater. Dr. Earl discussed in detail modern technics in the diagnosis and treatment of cancer of the gastrointestinal tract. Dr. Geer gave an illustrated lecture based on seventy-three x-ray plates of the chests of positive Mantoux reactors.

* * *

Professor August Krogh and his wife, Dr. Marie Krogh, of the University of Copenhagen, were guests of the Medical School of the University of Minnesota for ten days (March 25 to April 4). During their visit Professor Krogh presented lectures and seminars on the following subjects: "Osmotic and Ionic Regulation in Animals," "Circulatory Adjustment to Posture in Man," and "Comparative Physiology of Respiration." Dr. Marie Krogh presented a lecture on "Nutritional Problems in Denmark."

* * *

Dr. L. H. Rutledge of Detroit Lakes was named chief of staff at Saint Mary's Hospital there, when nine doctors of the county convened Tuesday, March 21, to hold a hospital staff organization meeting. Drs. O. O. Larsen and Arnold Larson were named vice president and secretary, respectively. Drs. J. E. Carman, A. E. Sprafka, H. W. Arndt, A. R. Ellingson, all of Detroit Lakes, G. G. Haight of Audubon, and C. W. Moberg of Lake Park, are also staff members of the hospital. Sister Monica superintends the institution.

* * *

The Itasca County Welfare board and hospital commissioners have made the following appointments for the ensuing year: Dr. M. J. McKenna, Grand Rapids, county surgeon; Drs. J. H. Bender, Bigfork; Dr. G. A. Miners, Deer River; Dr. G. M. Erskine, Grand Rapids; Dr. E. K. Rowles, Coleraine; Dr. J. C. Fueling, Bovey; Dr. E. T. Plowman, Marble; and Dr. E. H. Loofbourrow, Keewatin, as county physicians for their respective localities; Dr. C. E. Sisler, Grand Rapids, as house physician for the county home and infirmary. Appointed to act on the board of examiners for the University Hospital are Dr. M. J. McKenna and Dr. C. E. Sisler.

* * *

The fiftieth annual Founders' Day dinner of the Psi chapter of Alpha Kappa Kappa was held at the Kahler Hotel in Rochester, Minnesota, on Saturday, April 22. Drs. A. E. Brown, chairman, E. A. Addington, W. F. Braasch, M. W. Comfort, V. S. Counseller, E. J. Kepler, J. S. Lundy, H. W. Meyerding, L. W. Pollock, M. C. Piper, Waltman Walters, and H. W. Woltman were members of the committee in charge which arranged for the all-day program preceding the banquet. In the morning, clinics were held in various hospitals of the city. A noon luncheon followed at the Mayo Foundation House, with the initiation of thirteen new members of the chapter. Clinics were resumed in the afternoon. Undergraduate members of the fraternity from the University of Minnesota attended in a body. Many physicians from Saint Paul and Minneapolis drove to Rochester for the occasion. Attendance was estimated at approximately 125.

In Memoriam

Finley C. Spates

1855-1939

DR. FINLEY C. SPATES, a practicing physician of Saint Paul for fifty-two years, passed away February 27, 1939, at the age of eighty-three.

Dr. Spates was born near Red Wing, Minnesota, December 27, 1855, and spent his boyhood on a farm. He studied at Carleton College, Northfield, and received his medical training at Hahnemann Medical College in Chicago, graduating in 1883.

Upon graduation Dr. Spates began practice at Milbank, South Dakota, but in May, 1884, moved to Saint Paul. On September 29, 1883, he was married to Carrie Belle Williams of Saint Paul. A resident of Dayton's Bluff, he served the Bluff area and outlying communities in Hazel Park, North Saint Paul, Highwood and Newport for fifty-two years. His was the sacrificial life which characterized the old-time family physician in the days when the horse and buggy were the means of travel. During his lifetime he did much obstetrical work.

Dr. Spates was a charter member of the East Presbyterian Church and was active in the Arlington Hills East Presbyterian Church with which it merged. He was a staunch Christian and carried out Christian principles in his medical practice as well as in his social and home life. He loved children and they constituted a large portion of his patients. He liked people and in turn was loved by his patients.

Dr. Spates is survived by his widow, two sons, Dr. Kenneth C. Spates of Saint Paul and Leland W. Spates of Van Nuys, California; two daughters, Mrs. R. L. Faulkner and Eleanor F. Spates of Saint Paul.

Thomas Lowe

1858-1939

DR. THOMAS LOWE, of Pipestone, Minnesota, for several years a member of the State House of Representatives, died, following an attack of influenza, March 12, 1939, at the West Side Hospital, Saint Paul.

Dr. Lowe was born at La Chute, Quebec, Canada, November 8, 1858. When he was thirteen years of age, his family moved to the United States and located in Bremer County, Iowa. In 1877, the family moved to Murray County, where the father and three of his sons took up homesteads.

After attending school in Decorah, Iowa, Dr. Lowe taught school for a few years and then attended Hahnemann Medical College in Chicago, from which he was graduated in 1885. Upon receiving his medical degree, he returned to Murray County to practice, opening an office at Slayton. It was here that he met Sadie Southwell, who became his wife, on June 18, 1887. In 1904, the Lowes moved to Pipestone, where Dr. Lowe has since practiced.

In 1937, Dr. and Mrs. Lowe celebrated their golden wedding anniversary.

Throughout his long life, Dr. Lowe took an active interest in local and state politics. He was five times mayor of Pipestone. He served as commissioner of the Southwestern Minnesota Tuberculosis Sanatorium, and served on the Minnesota State Board of Medical Examiners for twenty years. He was a member of the Masonic, Woodman, Yeoman, and Knights of Pythias orders. When taken fatally ill, he was serving his second term in the House of Representatives and was very active in spite of his advanced age.

Doctor Lowe was the seat-mate of the only other physician in the House, Wm. J. Eklund, of Duluth. Dr. Lowe was chairman of the Committee of Public Health and Hospitals and represented his county on the important Appropriations Committee. Always fair and considerate, he was loved and respected by all members of the House. His clear thinking and ability came from his long service in the practice of medicine.

While actively engaged in the above-named organizations, he yet found time to take several postgraduate courses in New York; at one time serve as president of his local society, the Southwestern Minnesota Medical Society; and hold memberships in the Minnesota State and American Medical Associations.

Surviving Dr. Lowe are Mrs. Lowe and four children: Mrs. Raymond Hughes of Mankato; Margaret of Pipestone; William of Saint Paul; and Duncan of Weslaco, Texas.

MEDICAL BROADCAST FOR MAY

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 11:00 o'clock every Saturday morning over Station WCCO, Minneapolis (810 kilocycles or 370.2 meters) and Station WLB, University of Minnesota (760 kilocycles or 395 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota. The program for the month will be as follows:

May 6—Prenatal Care
May 13—First Year of Life
May 20—Prematurity
May 27—Prenatal Care of Teeth

MINNESOTA STATE MEDICAL ASSOCIATION

Eighty-sixth Annual Session

May 31, June 1 and 2, 1939

Minneapolis, Minnesota

Officers and Committees

President—George Earl	St. Paul
Past President—J. M. Hayes	Minneapolis
First Vice President—J. C. Jacobs	Willmar
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Section on Medicine

J. Allen Wilson	St. Paul
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Section on Surgery

V. S. Counseller	Rochester
F. H. Magney	Duluth
Charles Bolsta	Ortonville

Section on Specialties

W. A. O'Brien	Minneapolis

Committee on Local Arrangements

General Chairman—A. E. Cardle

General Advisory—George D. Head, W. H. Aurand, Moses Barron, James Blake, J. F. Corbett, J. A. Watson

Banquet—Gilbert Thomas, C. E. Arlander, F. R. Hirshfield, F. J. Kucera, D. A. MacDonald, H. F. Wahlquist

Commercial Exhibits—T. H. Sweetser, Ruth Boynton, W. R. Jones, E. J. Lillehei, W. G. Schaefer, Nora Winther

Golf—H. M. Lee, A. E. Benjamin, L. R. Boies, R. R. Cranmer, L. O. Doyle, E. G. Nylander

Hotel Reservations—H. W. Christianson, F. G. Benn, E. J. Borgeson, H. E. Hoffert, F. B. Mach, O. F. Robbins

House Arrangements—C. C. Kennedy, A. N. Bessesen, Jr., C. O. Hansen, A. B. Johnson, M. E. Knapp, J. T. Lapierre, J. H. Taylor

Public Relations—Gilbert Cottam, H. S. Diehl, F. E. Harrington, A. J. Herbolsheimer, F. A. Olson, T. W. Weum, S. M. White

Reunions—H. G. Scott, S. L. Arey, H. G. Benjamin, Reuben Erickson, W. A. Fansler, R. R. Knight

Scientific Exhibits—C. A. McKinlay, P. A. Anderson, R. P. Caron, T. J. Kinsella, M. C. Pfunder

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Announcements

Luncheons.—Twenty Round Table Luncheons have been arranged at the Hotel Curtis for this meeting, ten on Wednesday, May 31, and ten on Thursday, June 1. List of subjects and leaders for these luncheons have been sent to all members. Tickets must be purchased in advance for these luncheons. Attendance at each luncheon is limited to 20 and late comers will be accommodated according to their choice if limits have not already been reached. Price of luncheon tickets, $1.00.

Public Health Exposition.—The first Public Health Exposition ever sponsored by the Minnesota State Medical Association will open in the Auditorium basement Wednesday, May 31, and close Saturday, June 3. Admission will be by ticket but without entrance fee. Hours: 10 a.m. to 10 p.m. Special tours have been arranged during the day for the Minneapolis school children. Public Health lectures and moving pictures on popular subjects are scheduled each afternoon and evening. The Minnesota Department of Health, the Minneapolis City Health Department, the University of Minnesota and other official and voluntary welfare agencies are coöperating with the Minnesota State Medical Association in this Exposition. Every physician is urged to view this Exposition as well as the Scientific and Technical Exhibits on the floor above.

Annual Banquet.—The annual dinner for members and their wives will be held in the Auditorium, Thursday evening, June 1, at 7:30 p.m. Governor Harold E. Stassen will give the banquet address. Entertainment arranged by the Hennepin County Medical Society will follow the dinner.

The Southern Minnesota Medical Association will present a medal, following its annual custom, to the individual physician who presents the best scientific exhibit at this meeting. Judges will be selected from among distinguished out-of-state visitors. The award will be made at the Annual Banquet at the Hotel Curtis Thursday evening.

Golf Tournament.—The annual Golf Tournament will begin Friday at 1 p.m. at the Interlachen Country Club. Registration for the tournament should be made at the Registration Desk. Entrants may make up their own foursomes or apply to the Chairman, H. M. Lee, 1427 Medical Arts Building, Minneapolis, for partners. Attractive prizes have been donated for the winners.

Fracture Dinner.—One representative from each county and district society has been invited to attend a dinner at 6:30 p.m. Wednesday for the purpose of organizing fracture committees in each component medical society in the state. Charles L. Scudder of Boston will talk on "Duties of a Local Fracture Committee."

Fracture Meeting 8 P. M.—Following the dinner, Dr. Scudder will address a meeting in the East Room of the Hotel Curtis on "Fractures as a State Medical Association Problem." Open to all physicians.

The Minnesota Radiological Society will give a dinner at 6:30 p.m. Wednesday, May 31, at the Hotel Nicollet in honor of W. Edward Chamberlain of Philadelphia. Dr. Chamberlain will give the Russell D. Carman Memorial Lecture at 4 p.m. Wednesday.

The Trudeau Society will hold a dinner meeting Wednesday, May 31, 6:30 p.m. at the Hotel Nicollet. Dr. Robert G. Bloch, Chicago, whose appearance on the Thursday afternoon program is sponsored by the society, will be the principal speaker.

An American College of Surgeons breakfast will be held Friday morning at 7:30 a.m. at the Hotel Curtis. Members from Minnesota and adjacent states are invited to attend. Dr. Malcolm T. MacEachern, Chicago, Associate Director of the American College of Surgeons, will speak.

Visiting Speakers

Rock Sleyster, Wauwatosa President-elect of the American Medical Association, Medical Director Milwaukee Sanitarium.

Andrew C. Ivy, Chicago, Nathan Smith Davis Professor of Physiology and Pharmacology. Head of the Division at the Medical School of Northwestern University. Consultant Passavant Hospital, Chicago. Sponsored by the Northern Minnesota Medical Association.

Joseph Stokes, Jr., Philadelphia, Associate Professor of Pediatrics, University of Pennsylvania School of Medicine. Sponsored by the Northwestern Pediatric Society.

W. Edward Chamberlain, Philadelphia, Professor Radiology and Roentgenology, Temple University School of Medicine. Sponsored by the Minnesota Radiological Society. Dr. Chamberlain will deliver the annual Russell D. Carman Memorial Lecture.

Charles L. Scudder, Boston, Consulting Surgeon to the Massachusetts General Hospital. Formerly Assistant Professor of Surgery, Harvard Medical School.

Everett D. Plass, Iowa City, Professor of Obstetrics and Gynecology, State University of Iowa, College of Medicine.

Thomas Francis, Jr., New York, Professor of Bacteriology, New York University, College of Medicine. Sponsored by the Minnesota Society of Internal Medicine.

Robert G. Bloch, Chicago, Associate Professor Medicine, School of Medical Division of Biological Sciences, University of Chicago. Sponsored by the Trudeau Society.

F. W. Jackson, Winnipeg, Deputy Minister Health and Public Welfare of Manitoba.

Monsignor Maurice F. Griffin, Cleveland, Catholic Hospital Association.

Mr. J. G. Crownhart, Madison, Executive Secretary of the State Medical Society of Wisconsin.

The Honorable Henrik Shipstead, United States Senator.

Assistant Surgeon General C. E. Waller, Washington, United States Public Health Service.

BUSINESS PROGRAM

Hotel Curtis

Tuesday, May 30

4:00 P.M.	Council	Room B
4:00 P.M.	Reference Committees	
8:00 P.M.	House of Delegates	East Room

Wednesday, May 31

7:30 A.M.	Council	Room B
12:15 P.M.	House of Delegates	East Room

Thursday, June 1

7:30 A.M.	Council	Room B
5:00 P.M.	Installation of Officers Report of Secretary	Auditorium

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SCIENTIFIC PROGRAM

Wednesday, May 31

Morning Session—8:30 A. M.

Scientific Cinema
  Scaleniotomy for Cervical Rib
    Alton Ochsner, New Orleans
Announcements
    George Earl, St. Paul
Complete Fracture Demonstrations, Patients, Histories, Slides and X-rays
    O. W. Yoerg, Minneapolis
    V. P. Hauser, St. Paul
    H. W. Meyerding, Rochester
Scientific Cinema
  Some Practical Pointers on the Treatment of Intra-Capsular Fractures of the Neck of the Femur
    W. D. White, Minneapolis
    E. C. Henrikson, Minneapolis
Bile Salt Therapy in Gall Bladder Disease
    Andrew C. Ivy, Chicago
Headaches
    H. W. Woltman, Rochester
Treatment of the Mental Defective
    E. J. Engberg, Faribault

Round Table Luncheons—12:15 P. M.

Newer Drugs
  Leader—R. N. Bieter, University of Minnesota
Surgery of the Stomach (Indications for Various Procedures)
  Leader—W. C. Carroll, St. Paul
Surgery of the Small Bowel
  Leader—O. H. Wangensteen, University of Minnesota
Treatment of Sterility
  Leader—C. J. Ehrenberg, Minneapolis
Operative Treatment of Fractures
  Leader—Charles L. Scudder, Boston
Peptic Ulcer
  Leader—Andrew C. Ivy, Chicago
Allergy
  Leader—R. V. Ellis, University of Minnesota
Methods of Immunization Against Acute, Contagious and Infectious Diseases
  Leader—Joseph Stokes, Jr., Philadelphia
Treatment of Medical Emergencies
  Leader—H. E. Richardson, St. Paul
Roentgenography of the Chest
  Leader—W. Edward Chamberlain, Philadelphia

Afternoon Session—1:30 P. M.

Scientific Cinema
  Metrazol Treatment for Psychoses
    G. N. Ruhberg, St. Paul
Treatment of Mycotic Dermatitis
    H. E. Michelson, Minneapolis
Treatment of Atopic Dermatitis
    E. M. Rusten, Minneapolis
Diagnosis and Treatment of Hemorrhagic Diathesis
    C. H. Watkins, Rochester
Studies of Certain Respiratory Infections of Virus Origin
    Joseph Stokes, Jr., Philadelphia
Scientific Cinema
  Advances in Brain and Cord Surgery
    A. W. Adson, Rochester
Russell D. Carman Memorial Lecture
  Low Back Pain
    W. Edward Chamberlain, Philadelphia
Introduction: W. H. Ude, Minneapolis

Evening Session—8:00 P. M.

Fracture Meeting
  Presiding Officer, F. J. Elias, Duluth, Chairman Fracture Committee
Fractures as a State Medical Association Problem
  Charles L. Scudder, Boston

Thursday, June 1

Morning Session—8:30 A. M.

Scientific Cinema
  Inlying Graft for Hypospadias
    V. S. Counseller, Rochester
Causes of Uterine Bleeding
    J. L. McKelvey, University of Minnesota
Pelvic Pain
    W. A. Coventry, Duluth
Adenomyomata
    W. G. Benjamin, Pipestone
Treatment of Vaginal Discharges
    Everett D. Plass, Iowa City

Scientific Cinema
Fascia Transplant in Post-Operative Hernia
Hamlin Mattson, Minneapolis
Diagnosis of Virus Diseases
Thomas Francis, Jr., New York
Carcinoma of the Uterine Cervix
H. H. Bowing, Rochester
The Present Status of Trans-Urethral Resectionists: Competent and Otherwise
F. E. B. Foley, St. Paul

Round Table Luncheons—12:15 P. M.

Traumatic Surgery
Leader—F. J. Elias, Duluth
Toxemias of Pregnancy
Leader—Everett D. Plass, Iowa City
Respiratory Diseases
Leader—Thomas Francis, Jr., New York
Contagious Diseases
Leader—C. A. Stewart, Minneapolis
Peripheral Vascular Disease
Leader—B. T. Horton, Rochester
Surgery of the Gall Bladder
Leader—J. M. Hayes, Minneapolis
Surgical Procedures in Malignancy of the Colon
Leader—C. F. Dixon, Rochester
Induction of Labor
Leader—J. R. Manley, Duluth
Fracture of the Hip
Leader—M. S. Henderson, Rochester
Treatment of Cataract
Leader—J. S. Reynolds, Minneapolis

Afternoon Session—1:30 P. M.

Scientific Cinema
Esophagoscopy
L. R. Boies, Minneapolis
Recurring Thyrotoxicosis after Thyroidectomy
O. J. Hagen, Moorhead
Dysphagia
N. Logan Leven, St. Paul
Perforating Peptic Ulcer
R. H. Wilson, Winona
Injuries of Eyes
D. L. Tilderquist, Duluth
Deformities of the Face Corrected by Plastic Surgery
G. B. New, Rochester
Scientific Cinema
Pathologic Physiology of the Common Bile Duct
Waltman Walters, Rochester
Unsuspected Pulmonary Tuberculosis
Robert G. Bloch, Chicago
Surgery of Pulmonary Tuberculosis: Indications and Results
H. A. Carlson, Ah-Gwah-Ching
Male Sex Hormones
M. H. Hoffman, St. Paul
Installation of Officers
Presiding: George Earl, President
Report of the Secretary
B. B. Souster, St. Paul

Evening Session—7:30 P. M.

ANNUAL BANQUET, AUDITORIUM

Toastmaster: George Earl

Introduction of Mrs. A. C. Baker, Fergus Falls, President, Women's Auxiliary
Presentation of Southern Minnesota Medical Association Medal
Address: The Honorable Harold E. Stassen, Governor of the State of Minnesota
Floor Show

Friday, June 2

CONFERENCE ON MEDICAL PROBLEMS IN MINNESOTA

Morning Session—8:30 A. M.

Scientific Cinema
Treatment of Burns
Grover C. Penberthy, Detroit
Keeping America Healthy
Asst. Surgeon General C. E. Waller, Washington
Medical Care and its Distribution in Canada
F. W. Jackson, Winnipeg
Scientific Cinema
Standard Obstetrical Routine
Lyle G. McNeile and Donald G. Tollefson, Los Angeles County Hospital
Personal Observations on Medical Plans in Europe
Mr. J. G. Crownhart, Madison, Wis.
Health of the People of Minnesota
W. A. O'Brien, University of Minnesota
Our National Investment in Health
Monsignor Maurice F. Griffin, Cleveland

Afternoon Session—1:30 P. M.

Scientific Cinema
Carcinoma of the Breast: Radical Amputation
S. W. Harrington, Rochester
Health and the American Standard of Living
F. S. Chapin, University of Minnesota
Minnesota Medical Legislation
The Honorable J. A. A. Burnquist, St. Paul
The Doctor and His Patient
George Earl, St. Paul
Professional Service and the Public Trust
The Honorable Henrik Shipstead, U. S. Senate

PICROTOXIN TREATMENT OF BARBITURATE INTOXICATION

(Continued from Page 310)

Conclusions

1. Animal experimentation and clinical trial have established some justification for the cautious use of picrotoxin in barbiturate poisoning.

2. In the presence of a known case of barbiturate intoxication, picrotoxin may be safely administered intravenously at the rate of 1 mg. per minute, for a total dosage of 9 mg. to 12 mg. at intervals of one-half hour to four hours.

3. The case here reported showed the first signs of return of consciousness when the "barbiturate equivalent" of picrotoxin had been administered.

4. The customary supportive measures must be carried out while treating barbiturate intoxication with picrotoxin and in addition each case must be observed closely and dosage of picrotoxin gauged according to clinical signs and response of the individual case.

References

1. American Medical Association: Present Status of Picrotoxin in poisoning by the barbiturates; Report of The Council on Pharmacy and Chemistry. Jour. Am. Med. Assn., 112:431-33, (Feb. 4) 1939.
2. Bleckwenn, W. J., and Masten, Mabel G.: The antidotal treatment of barbiturate intoxication. Jour. Am. Med. Assn., 111:504-506, (Aug. 6) 1938.
3. Kohn, Richard, Platt, S. S., and Saltman, S. Y.: The picrotoxin barbiturate antagonism. Jour. Am. Med. Assn., 111:387-390, (July 30) 1938.
4. Maloney, A. H., Fitch, R. H., and Tatum, A. L.: Picrotoxin as an antidote in acute poisoning by the shorter acting barbiturates. Jour. Pharmacol. and Exper. Therap., 41:465-482, (April) 1931.
5. Maloney, A. H., and Tatum, A. L.: Picrotoxin as an antidote in acute poisoning by the longer acting barbiturates. Jour. Pharmacol. and Exper. Therap., 44:337-352, (March) 1932.
6. Murphy, William S., Connerty, Harold V., Connolly, Aloysius J., and Koppanyi, Theodore: Barbiturate poisoning treated with picrotoxin. Jour. Lab. and Clin. Med., 22:350-356, (Jan.) 1937.

FIELD CLINICS FOR CRIPPLED CHILDREN

Orthopedic surgeons from the Minnesota-Dakota Orthopedic Club are coöperating with the Division of Services for Crippled Children of the State Board of Control by serving again this year as orthopedic consultants at the field clinics for crippled children which are conducted annually by the Division. The first clinic of the spring series was held April 15 in St. Cloud with Drs. E. T. Evans and M. O. Henry, both of Minneapolis, as examining orthopedic surgeons. Drs. J. F. Pohl and J. H. Moe, also of Minneapolis, were in charge of the Morris Clinic, which was held April 22. The schedule for the remaining five clinics follows:

Willmar Clinic, April 29—Dr. V. L. Hart, Minneapolis; Mayo Clinic orthopedic surgeon.

Crookston Clinic, May 13—Dr. G. A. Williamson, Saint Paul; Dr. J. R. Kuth, Duluth.

Austin Clinic, May 20—Dr. C. C. Chatterton, Saint Paul; Mayo Clinic orthopedic surgeon.

Detroit Lakes Clinic, June 3—Dr. G. A. Williamson, Minneapolis; Dr. Wm. H. Von der Weyer, Saint Paul.

Aitkin Clinic, June 10—Dr. S. W. Shimonek, Saint Paul; Dr. M. H. Tibbetts, Duluth.

The purposes of field clinics for physically handicapped children in the state is to find new cases, to follow up old cases, to emphasize preventive health education, and to provide consultation services for the local family physician for his indigent crippled children patients. All physically handicapped persons under twenty-one years of age who cannot provide private medical care are eligible upon presenting a letter of referral from their family physician.

Coöperating also with the Division of Services for Crippled Children is the Division of Vocational Rehabilitation of the State Department of Education, which sends an expert from its staff to each clinic to give vocational guidance, and the Minnesota Public Health Association, which coöperates with the preliminary educational program.

RED RIVER VALLEY SOCIETY

Members of the Red River Valley Medical Society and their wives, numbering fifty-five, including a delegation from Thief River Falls, assembled at the Hotel Crookston Tuesday night for the annual dinner meeting of the society, followed by separate business sessions for the physicians and their auxiliary.

The meeting for the auxiliary held at the home of Mrs. G. A. Morley, was the annual business session, with election of officers and preparation of the group's report for the state medical auxiliary meeting next month. Mrs. S. H. Stuurmans of Erskine was named president of the auxiliary, succeeding Mrs. Baldwin Borreson, with Mrs. H. M. Blegen of Warren first vice president; Mrs. G. W. Hohl of Ada, second vice president; Mrs. D. V. Boardman of Twin Valley, recording secretary; Mrs. H. H. Hedemark of Thief River Falls, corresponding secretary; and Mrs. C. L. Oppegaard of Crookston, treasurer.

The joint session of the physicians and their wives was featured by an address by Mrs. Virginia Liebeler, state director of the Minnesota Hospital Service Association.

After members of the auxiliary had adjourned to the home of Mrs. Morley, physicians heard an address by A. W. Aamodt, state supervisor for the Farm Security Administration, on the medical problem presented by the low income groups, operating on borrowed government capital and under the supervision of the FSA.

The meeting for physicians was concluded with the showing of three scientific films.

MINNESOTA HOSPITAL ASSOCIATION

The sixteenth annual meeting of the Minnesota Hospital Association will be held Thursday, Friday and Saturday, May 25, 26 and 27, 1939, in the St. Paul Hotel, St. Paul, Minnesota. Dr. Peter Ward, Saint Paul, president of the association, will preside. Thursday morning will be devoted to registration and a meeting of the Board of Directors. The regular business session will occupy the Thursday afternoon meeting, to be followed at 6:00 P. M. with a buffet supper at St. Joseph's Hospital.

Scientific papers presented by leading hospital authorities covering the different departments in a well organized hospital will occupy the session Friday morning. A noon luncheon at the Lowry Hotel will be addressed by B. W. Caldwell, M.D., Executive Secretary, American Hospital Association; M. T. McEachern, M.D., Associate Director, American College of Surgeons and President, International Hospital Association; and R. C. Buerki, M.D., President, American College of Hospital Directors.

Friday afternoon the following allied organizations will hold sessions: Minnesota Association of Nurse Anesthetists, Minnesota Dietetic Association, Minnesota Chapter—National Executive Housekeepers' Association, Minnesota Association of Hospital, Medical and Institution Librarians, Minnesota Society of Medical Technologists, Minnesota Occupational Therapy Association, Minnesota Chapter American Physiotherapy Association, Minnesota Record Librarians' Association. A General Session at 3:30 P. M. will consist of a round table discussion led by R. C. Buerki, M.D.

At the annual banquet to be held Friday evening the speakers will include Basil McLean, M.D., Superintendent, Strong Memorial Hospital, Rochester, New York; George Earl, M.D., President Minnesota State Medical Association; and Honorable Harold E. Stassen, Governor of Minnesota.

The meeting Saturday morning will include addresses on various phases of hospitalization to be followed by the final business session. A golf tournament at the White Bear Yacht Club will conclude the program in the afternoon.

# ◆ WOMEN'S AUXILIARY ◆

MRS. W. B. ROBERTS, Minneapolis, *President*
MRS. E. V. GOLTZ, 2259 Summit Avenue, Saint Paul, *Publicity Chairman*

The Annual State Convention which will be held in Minneapolis May 31 to June 2, inclusive, should draw many members from the various county auxiliaries. Registration will open May 30 from 4 to 6 p. m. at the Curtis Hotel and the following morning at 9 a.m. at the Curtis Hotel. Wednesday morning, May 31, the pre-convention executive board meeting will be held at the Leamington Hotel with a luncheon following for members of the board only. From 3 to 5 p. m. that day the members of the Hennepin County Auxiliary will entertain all auxiliary members at a tea in the Hennepin County rooms on the 20th floor of the Medical Arts Building. The evening will be devoted to the scientific and allied health displays in the Municipal Auditorium. Thursday, June 1, the annual State Auxiliary meeting will be held at 10 a. m. at the Interlachen Country Club. Those wishing to attend this meeting will find cars awaiting them at the Curtis Hotel at 9:15. A luncheon will be held at Interlachen following the meeting and cars will start from the Curtis Hotel at 12 o'clock noon for those who wish to attend the luncheon and not the annual meeting in the morning. At 6:30 p. m. members of the auxiliary will meet with the doctors at dinner at the Leamington Hotel. Friday, June 2, a sightseeing trip with a visit to the Sibley House at Mendota where luncheon will be served will conclude the convention program. Cars will leave the Curtis Hotel at 11 a. m. and will return guests to the hotel after luncheon. Hennepin County extends a very cordial invitation to all members to attend and it is hoped that there will be a large attendance.

* * *

Our state president, Mrs. Wm. B. Roberts, presided at the recent meeting of the Women's Field Army of the American Society for the Control of Cancer, held in Saint Paul. "Civilization Against Cancer" was the theme of the meeting. The Winona Auxiliary, of which Mrs. C. P. Robbins is president, received recognition for their contribution to the fund for Control of Cancer at this meeting. This was the project of the Winona Auxiliary for their activity this year.

* * *

The seventeenth annual convention of the national Auxiliary will be held at the Hotel Chase, St. Louis, Missouri, May 15 to 19 inclusive. Registration will be held from 10 a. m. to 4 p. m. Sunday, May 14, with a tea in the afternoon for the national board in honor of Mrs. Charles C. Tomlinson, president. Monday, May 15, the national board meeting will be held in the Empire Room, Hotel Chase, at 9 a. m., and from 1:30 to 4:45 p. m. there will be a tea at the private gardens of St. Louis County. Tuesday, May 16, the formal opening of the convention and general session will be held in the Empire room of the Hotel Chase from 9 a. m. to 12 noon with luncheon at the St. Louis Woman's Club at 12:30, followed by tours with a tea at the St. Louis University Woman's Club at 4 p. m. The opening meeting of the American Medical Association will be at 8 p. m. in the Municipal Auditorium. Wednesday, May 17, there will be a general session at 9 a. m. at the Chase Hotel with auxiliary luncheon at 1 p. m. at the Chase Club, followed by exhibits and music and conferences. A reception will be held that night for all visiting ladies with a motion picture revue of United States Seal fisheries and a fur fashion show. Thursday, May 18, the post-convention executive committee meeting will be held at 9 a. m. followed by the post-convention Board of Directors meeting. From 12:30 to 3:30 in the afternoon there will be a Mississippi steamboat trip for men and women and at 7 p. m. the annual "Bring Your Husband" dinner at the Chase Hotel, followed by a reception in honor of the president of the American Medical Association at the Hotel Jefferson. A Woman's Golf Round and Blind Bogey with trophies and prizes will be the feature for Friday, May 19, the closing day. It is hoped that Minnesota will be well represented at the annual national meeting.

* * *

Mrs. Leo Crafts of the Hennepin County Auxiliary passed away April 13, in Minneapolis. Her home was at 610 Fifth Street S. E. Mrs. Crafts was prominently identified with Auxiliary affairs, having served as president of the Hennepin County Auxiliary, and was a member of the Revision Committee of the State Auxiliary at the time of her death. She had spent the past fifty years as a resident of Minneapolis and was an instructor in Art at the State University from 1889 to 1901. She studied art in the East under a group of well known teachers including Edmund Tarbel, Joseph De Camp and Roda Holman Nichols, and she was a member of the Fine Arts Club of Boston, Fine Arts of Minneapolis, Women's Club and a member of the board of directors of the Y.W.C.A. and Travelers Aid. Many members of the auxiliary will remember the lovely poster she completed for the Hennepin County Auxiliary. She was an extensive traveler, having spent much time in Europe. Sincerest sympathy is extended to her family.

* * *

The Ramsey County Auxiliary recently voted to give $100 to a fund to provide an Infantile Paralysis Center in Ramsey County. The annual reciprocity tea was given Monday, April 27, in the Ramsey County Library rooms. Dr. George Earl spoke on "Phases of Socialized Medicine." Mrs. Donald Bacon read the play "Kiss the Boys Good-bye." Invitations had been extended to various women's organizations to attend. Mrs. Wm. B. Roberts, State President, was a guest. Tea was served to seventy guests following the program.

BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

YOUR CHEST SHOULD BE FLAT. F. A. Weisman, M.D., F.A.C.P. Assistant Professor of Medicine, University of Minnesota; Member of Consulting Staff, Glen Lake Sanatorium, Oak Terrace, Minnesota; Member of Staff of St. Andrew's and St. Mary's Hospitals, Minneapolis. 145 pages. Illus. Price, cloth, $2.00. Philadelphia: J. B. Lippincott & Co., 1939.

In a small volume Dr. Weisman has presented the results of his studies of thoracic indices of 20,000 school children as well as smaller groups of tuberculous individuals and preventorium children. From this material he has arrived at a normal thoracic index, that is, the ratio of the antero-posterior to the lateral dimensions of the chest through infancy, childhood and adult life. He has shown that the individual who on casual examination appears to be flat chested is very likely actually to be deep chested, that is, to have a high thoracic index, and that the appearance is due to postural differences rather than to actual flattening of the chest. While Dr. Weisman has found that the thoracic indices of young adults having tuberculosis are higher than those of similar groups of healthy individuals, he also has very clearly shown that this index is an indication of malnutrition and under-development. His study of the school children in Minneapolis shows a higher thoracic index in the children coming from poorer districts than in those coming from the more well-to-do parts of the city.

It is a recognized fact that prevalence of open tuberculosis is greater in neighborhoods of lower economic strata. It seems to me that Dr. Weisman's thesis, "that the deep chest makes better soil for tuberculosis," is based on the corollary that tuberculosis is more prevalent in the lower economic level, that malnutrition and under-development are more prevalent in the same strata and that the majority of individuals with deep chest, i.e., high thoracic indices, will come from such an environment. Therefore, the person with the deep chest is more apt to have tuberculosis. This book should be a valuable addition to the library of physicians, physical education directors, social service workers and teachers in emphasizing the problem of malnutrition and in presenting a simple method for indicating such condition.

G. A. Hedberg, M.D.

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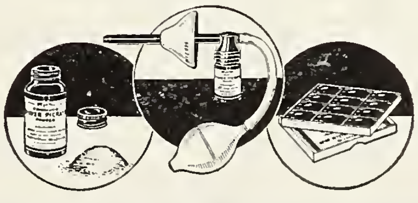

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*Terms expire December 31, of year indicated.

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W. E. Hatch, M.D.	Duluth
W. A. Coventry, M.D.	Duluth

SCOTT COUNTY

C. J. Olson, M.D.	Belle Plaine
B. F. Pearson, M.D.	Shakopee
H. D. Nagel, M.D.	Waconia

SHERBURNE COUNTY

A. B. Roehlke, M.D.	Elk River

SIBLEY COUNTY

W. P. Olson, M.D.	Gaylord
Rolf Hovde, M.D.	Winthrop
Thomas Martin, M.D.	Arlington

STEARNS COUNTY

C. F. Brigham, M.D.	St. Cloud
A. H. Zachman, M.D.	Melrose
William Friesleben, M.D.	Sauk Rapids

STEELE COUNTY

(No Committee)

STEVENS COUNTY

E. T. Fitzgerald, M.D.	Morris
C. E. Caine, M.D.	Morris
M. L. Ransom, M. D.	Hancock

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W. C. Kaufman, M.D.	Appleton
C. L. Scofield, M.D.	Benson

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TRAVERSE COUNTY

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N. F. Doleman, M.D.	Tintah
C. H. Clark, M.D.	Browns Valley

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C. G. Ochsner, M.D.	Wabasha
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A. H. Borgerson, M.D.	Sebeka

WASECA COUNTY

B. J. Gallagher, M.D.	Waseca
C. R. Chadbourn, M.D.	Janesville
W. C. Bernstein, M.D.	New Richland

WASHINGTON COUNTY

W. R. Humphrey, M.D.	Stillwater
E. V. Strand, M.D.	Bayport
J. W. Stuhr, M.D.	Stillwater

WATONWAN COUNTY

Albert Thompson, M.D.	St. James
H. B. Grimes, M.D.	Madelia
O. E. Hagen, M.D.	Butterfield

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L. H. McMahon, M.D.	Breckenridge
W. E. Wray, M.D.	Campbell
E. W. Rimer, M.D.	Breckenridge

WINONA COUNTY

C. P. Robbins, M.D.	Winona
E. E. Christensen, M.D.	Winona

WRIGHT COUNTY

W. E. Hart, M.D.	Monticello
L. H. Bendix, M.D.	Annandale
T. J. Catlin, M.D.	Buffalo

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A. G. Sanderson, M.D.	Granite Falls
R. H. Kath, M.D.	Wood Lake
M. I. Hauge, M.D.	Clarkfield

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to the

Minnesota State Medical Association

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Counties—Aitkin, Beltrami, Benton, Cass, Clearwater, Crow Wing, Hubbard, Koochiching, Morrison, Stearns, Todd, Wadena.

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Counties—Becker, Clay, Douglas, Grant, Kittson, Lake of the Woods, Mahnomen, Marshall, Norman, Otter Tail, Pennington, Polk, Red Lake, Roseau, Wilkin.

DISTRICT NO. 9

B. S. Adams, M.D...........................Hibbing
Counties—Carlton, Cook, Itasca, Lake, St. Louis.

MINNESOTA STATE MEDICAL ASSOCIATION

COUNTY SOCIETY ROSTER

BLUE EARTH COUNTY MEDICAL SOCIETY

Regular meetings, last Monday of each month
Annual meeting in December
Number of Members: 31

President	
Liedloff, A. G.	Mankato
Secretary	
Koenigsberger, Charles	Mankato
Andrews, R. N.	Mankato
Benham, E. W.	Mankato
Black, William	Mankato
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Dahl, G. A.	Mankato
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Franchere, F. W.	Lake Crystal
Fugina, G. R.	Mankato
Hankerson, R. G.	Minnesota Lake
Hassett, R. G.	Mankato
Holbrook, J. S.	Mankato
Howard, M. I.	Mankato
Juliar, R. O.	St. Clair
Kemp, A. F.	Mankato
Liedloff, A. G.	Mankato
Lloyd, H. J.	Mankato
Macbeth, J. L.	St. Clair
Miller, V. I.	Mankato
Morgan, H. O.	Amboy
Osborn, Lida	Mankato
Penn, G. E.	Mankato
Samuelson, L. G.	Mankato
Schlesselman, J. T.	Mankato
Schmidt, P. A.	Good Thunder
Sohmer, A. E.	Mankato
Stillwell, W. C.	Mankato
Troost, H. B.	Mankato
Vezina, J. C.	Mapleton
Wentworth, A. J.	Mankato
Williams, H. O.	Lake Crystal

BLUE EARTH VALLEY MEDICAL SOCIETY

Faribault and Martin Counties
Regular meetings, first Thursday of February, May, August and November
Annual meeting, first Thursday in November
Number of Members: 38

President	
Russ, H. H.	Blue Earth
Secretary	
Chambers, W. C.	Blue Earth
Bailey, H. B.	Fairmont
Barr, W. H.	Wells
Bergen, C. T.	Blue Earth
Blanchard, H. G.	Fairmont
Boysen, Herbert	Welcome
Chambers, W. C.	Blue Earth
Cooper, M. D.	Winnebago
Demo, P. W.	Wells
Farrish, R. C.	Sherburn
Fisher, I. I.	Ceylon
Gardner, V. H.	Fairmont
Havel, T. E.	Blue Earth
Heimark, J. J.	Fairmont
Henderson, A. J.	Kiester
Holm, P. F.	Wells
Hunt, R. C.	Fairmont
Hunte, A. F.	Bylas, Ariz.
Jacobs, A. C.	Elmore
Johnson, D. W.	Fairmont
Johnson, H. P.	Fairmont
Krause, C. W.	Fairmont
Luedtke, G. H.	Fairmont
Marken, M. H.	Fairmont
McGroarity, J. J.	Easton
McKean, F. F.	Delavan
Miller, H. A.	Fairmont
Mills, J. L.	Winnebago
Raymond, J. H.	Triumph
Rowe, W. H.	Fairmont
Russ, H. H.	Blue Earth
Sommer, A. W.	Elmore
Sybilrud, H. W.	Bricelyn
Thayer, E. A.	Truman
Vaughan, V. M.	Truman
Virnig, M. P.	Wells
Wilson, C. E.	Blue Earth
Youngman, R. A.	Fairmont
Zemke, E. E.	Fairmont

CAMP RELEASE DISTRICT MEDICAL SOCIETY

Chippewa, Lac Qui Parle and Yellow Medicine Counties
Annual meeting, March
Number of Members: 24

President	
Roust, H. A.	Montevideo
Secretary	
Westby, Magnus	Madison
Bacon, R. S.	Montevideo
Bergh, L. N.	Montevideo
Boody, G. J., Jr.	Dawson
Burns, F. M.	Milan
Burns, M. A.	Milan
Cress, E. E.	Boyd
Foshager, H. T.	Clara City
Hauge, M. I.	Clarkfield
Hauge, M. M.	Clarkfield
Herbert, W. L.	Granite Falls
Holmberg, L. J.	Canby
Hudec, E. R.	Echo
Johnson, C. M.	Dawson
Jordan, L. S.	Granite Falls
Kath, R. H.	Wood Lake
Lee, W. N.	Madison
Lima, Ludvig	Montevideo
Nelson, M. S.	Granite Falls
Pertl, A. L.	Canby
Roust, H. A.	Montevideo
Smith, L. G.	Montevideo
Tangen, G. M.	Canby
Westby, Magnus	Madison
Westby, Nels	Madison

CLAY-BECKER COUNTY MEDICAL SOCIETY

Annual meeting, December
Number of Members: 23

President	
Moberg, C. W.	Lake Park
Secretary	
Flancher, L. H.	Lake Park
Aborn, W. H.	Hawley
Bottolfson, B. T.	Moorhead
Carman, J. E.	Detroit Lakes
Duncan, J. W.	Moorhead
Ellingson, A. R.	Detroit Lakes
Flancher, L. H.	Lake Park
Gosslee, G. L.	Moorhead
Gunderson, R. M.	Lake Park
Hagen, O. J.	Moorhead
Haight, G. G.	Audubon
Humphrey, E. W.	Moorhead
Ingebrigtson, E. K.	Moorhead
Larsen, O. O.	Detroit Lakes
Larson, Arnold	Detroit Lakes
Moberg, C. W.	Lake Park
Rice, H. G.	Moorhead
Rutledge, L. H.	Detroit Lakes
Seitz, S. B.	Barnesville
Simison, Carl	Barnesville
Simison, C. W.	Hawley
Stafne, W. A.	Moorhead
Thysell, F. A.	Moorhead
Thysell, V. D.	Hawley

EAST CENTRAL MINNESOTA MEDICAL SOCIETY

Anoka, Chisago, Isanti, Kanabec, Mille Lacs, Pine and Sherburne Counties
Annual meeting, December
Number of Members: 34

President	
Arends, A. L.	Sandstone
Secretary	
Ness, Claire M.	Cambridge
Arends, A. L.	Sandstone
Blomberg, W. R.	Princeton
Blumenthal, J. S.	Columbia Heights
Bossert, C. S.	Mora
Brink, D. M.	Isle
Brownstone, Manuel	Sandstone
Callahan, F. F.	Pokegama
Clothier, E. F.	Elk River
Cooney, H. C.	Princeton
Dedolph, T. H.	Braham
Dredge, H. P.	Sandstone
Gardner, W. P.	Anoka
Gully, R. J.	Cambridge
Halpin, J. E.	Rush City

Hedenstrom, L. H..........Cambridge
Holmes, A. E..........Rush City
Kaufman, E. J..........Anoka
Kelsey, C. G..........Hinckley
McBroom, D. E..........Cambridge
Ness, Claire M..........Cambridge
Neumaier, Arthur..........Lindstrom

Nordman, W. F..........Mora
Nygren, W. T..........Braham
Petersen, P. C..........Braham
Peterson, A. A..........Mora
Roehlke, A. B..........Elk River
Schlesselman, George..........Anoka

Spurzem, R. J..........Anoka
Stephan, E. L..........Hinckley
Stratte, A. K..........Pine City
Swensen, R. G..........North Branch
Trommald, Gladys B. K..........Anoka
Vik, Melvin..........Onamia
Wasson, L. F..........Chisago City

FREEBORN COUNTY MEDICAL SOCIETY

Regular meetings, Quarterly
Annual meeting, December
Number of Members: 23

President
Barr, L. C..........Albert Lea

Secretary
Prins, L. R..........Albert Lea

Barr, L. C..........Albert Lea
Burns, H. D..........Albert Lea
Butturff, C. R..........Freeborn
Calhoun, F. W..........Albert Lea
Donovan, D. L..........Albert Lea

Folken, F. G..........Albert Lea
Freeman, J. P..........Albert Lea
Freligh, W. P..........Albert Lea
Gamble, J. W..........Albert Lea
Gamble, P. M..........Albert Lea
Gullixson, A..........Albert Lea
Jerome, Bourne..........Newark, N. J.
Kaasa, L. J..........Albert Lea
Kamp, B. A..........Albert Lea

Leopard, B. A..........Albert Lea
Manley, L. V..........Northampton, Mass.
Palmer, C. F..........Albert Lea
Palmer, W. L..........Albert Lea
Prins, L. R..........Albert Lea
Schuele, D. T..........Albert Lea
Schultz, J. A..........Albert Lea
Swanson, R. R..........Albert Lea
Whitson, S. A..........Alden

GOODHUE COUNTY MEDICAL SOCIETY

Regular meetings, none
Annual meeting, December
Number of Members: 22

President
Hartnagel, G. F..........Red Wing

Secretary
Juers, E. H..........Red Wing

Aanes, A. M..........Red Wing
Aanes, A. R..........Ellsworth
Anderson, S. H..........Red Wing
Brusegard, J. F..........Red Wing

Claydon, D. R..........Red Wing
Claydon, H. F..........Zumbrota
Claydon, L. E..........Red Wing
Flom, M. G..........Zumbrota
Graves, R. B..........Red Wing
Hartnagel, G. F..........Red Wing
Hedin, R. F..........Chicago, Ill.
Johnson, A. E..........Red Wing
Jones, A. W..........Red Wing

Juers, E. H..........Red Wing
Liffrig, W. W..........Goodhue
Mack, J. J..........Little Rock, Ark.
McGuigan, H. T..........Red Wing
Nordholm, V. W..........Red Wing
Smith, M. W..........Red Wing
Steffens, L. A..........Red Wing
Vaaler, T..........Cannon Falls
Williams, M. R..........Cannon Falls

HENNEPIN COUNTY MEDICAL SOCIETY

Regular meetings, first Monday each month excepting
June, July, August and September
Annual meeting, October
Number of Members: 622

President
Reynolds, J. S..........Minneapolis

Secretary
Daniel, L. M..........Minneapolis

Aagaard, G. N., Jr..........Minneapolis
Abramson, Milton..........Minneapolis
Adams, J. M..........Minneapolis
Alexander, H. A..........Minneapolis
Aling, C. A..........Minneapolis
Allen, H. W..........Minneapolis
Allison, R. G..........Minneapolis
Altnow, H. O..........Minneapolis
Andersen, A. G..........Minneapolis
Andersen, S. C..........Minneapolis
Anderson, D. D..........Minneapolis
Anderson, E. D..........Minneapolis
Anderson, E. R..........Minneapolis
Anderson, F. J..........Minneapolis
Anderson, J. K..........Minneapolis
Anderson, K. W..........Minneapolis
Anderson, P. A..........Minneapolis
Anderson, U. S..........Minneapolis
Andreassen, E. C..........Minneapolis
Andrews, R. S..........Minneapolis
Annis, H. B..........Minneapolis
Arey, S. L..........Excelsior
Arlander, C. E..........Minneapolis
Arling, L. S..........Minneapolis
Arnold, Anna W..........Minneapolis
Arnold, D. C..........Minneapolis
Arvidson, C. G..........Minneapolis
Aune, Martin..........Minneapolis
Aurand, W. H..........Minneapolis

Baken, M. P..........Minneapolis
Baker, A. B..........Minneapolis
Baker, A. T..........Minneapolis
Baker, E. L..........Minneapolis
Baker, Looe..........Minneapolis
Balkin, S. G..........Minneapolis
Barber, J. P..........Minneapolis
Barron, Moses..........Minneapolis
Bass, G. W..........Minneapolis
Baxter, S. H..........Minneapolis
Bayard, H. F..........Minneapolis
Beard, A. H..........Minneapolis
Beckman, W. G..........Minneapolis
Bedford, E. W..........Minneapolis
Bell, E. T..........Minneapolis
Belzer, M. S..........Minneapolis

Benesh, N. G..........Minneapolis
Benjamin, A. E..........Minneapolis
Benjamin, E. G..........Minneapolis
Benjamin, H. G..........Minneapolis
Benn, F. G..........Minneapolis
Berger, A. G..........Minneapolis
Bergh, G. S..........Minneapolis
Berkwitz, N. J..........Minneapolis
Berman, Reuben..........Minneapolis
Bessesen, A. N., Jr..........Minneapolis
Bessesen, W. A..........Minneapolis
Blake, James..........Hopkins
Blake, J. A..........Hopkins
Blaustone, H. H..........Minneapolis
Bockman, M. W. H..........Minneapolis
Boehme, E. J..........Minneapolis
Boies, L. R..........Minneapolis
Booth, A. E..........Minneapolis
Boreen, C. A..........Minneapolis
Borgeson, E. J..........Minneapolis
Borman, C. N..........Minneapolis
Bouman, H. A. H..........Minneapolis
Boynton, Ruth E..........Minneapolis
Bratrud, A. F..........Minneapolis
Brekke, H. J..........Minneapolis
Brooks, C. N..........Minneapolis
Brown, E. D..........Paynesville
Brutsch, G. C..........Minneapolis
Bryant, F. L..........Minneapolis
Bulkley, Kenneth..........Minneapolis
Butler, John..........Minneapolis
Buzzelle, L. K..........Minneapolis

Cable, M. L..........Minneapolis
Cabot, V. S..........Minneapolis
Cady, L. H..........Minneapolis
Callerstrom, G. W..........Minneapolis
Cameron, Isabell L..........Minneapolis
Camp, W. E..........Minneapolis
Campbell, L. M..........Minneapolis
Campbell, O. J..........Minneapolis
Cardle, A. E..........Minneapolis
Carey, J. B..........Minneapolis
Carlson, Lawrence..........Minneapolis
Carlson, L. T..........Minneapolis
Caron, R. P..........Minneapolis
Cavanor, F. T..........Minneapolis
Chesley, A. J..........Minneapolis
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Christianson, H. W..........Minneapolis

Clark, H. S..........Minneapolis
Clay, L. B..........Minneapolis
Cohen, B. A..........Minneapolis
Cohen, S. S.......... Oak Terrace
Condit, W. H..........Minneapolis
Cook, H. W..........Minneapolis
Cooperman, H. O..........Minneapolis
Corbett, J. F..........Minneapolis
Corniea, A. D..........Minneapolis
Cottam, Gilbert,..........Minneapolis
Cranmer, R. R..........Minneapolis
Cranston, R. W..........St. Louis Park
Creevy, C. D..........Minneapolis
Creighton, R. H..........Minneapolis
Curtin, J. F..........Minneapolis
Cutts, George..........Minneapolis
Cutts, R. E..........Minneapolis

Dady, E. E..........Minneapolis
Dahl, E. O..........Minneapolis
Dahl, J. A..........Minneapolis
Daniel, D. H..........Minneapolis
Daniel, L. M..........Minneapolis
Dart, L. O..........Minneapolis
Davis, J. C..........Minneapolis
del Plaine, C. W..........Minneapolis
Devereaux, T. J..........Wayzata
Diehl, H. S..........Minneapolis
Diessner, H. D..........Minneapolis
Doering, R. E..........Minneapolis
Dorge, R. I..........Minneapolis
Dornblaser, H. B..........Minneapolis
Dorsey, G. C..........Minneapolis
Doxey, G. L..........Minneapolis
Doyle, L. O..........Minneapolis
Drake, C. R..........Minneapolis
Drill, H. E..........Hopkins
Duff, E. R..........Minneapolis
Dukelow, D. A..........Minneapolis
Dumas, A. G..........Minneapolis
Dunlap, E. H..........Minneapolis
Dunn, G. R..........Minneapolis
Duryea, W. M..........Minneapolis
Dutton, C. E..........Minneapolis
Dvorak, B. A..........Minneapolis
Dwan, P. F..........Minneapolis
Dworsky, S. D..........Minneapolis

Eckhardt, C. L..........Minneapolis
Ehrenberg, C. J..........Minneapolis
Ehrlich, S. P..........Minneapolis

Eich, Matthew	Minneapolis
Eisenstadt, D. H.	Minneapolis
Eitel, G. D.	Minneapolis
Ellison, D. E.	Minneapolis
Engelhart, P. C.	Minneapolis
Engstrand, O. J.	Minneapolis
Erdmann, C. A.	Minneapolis
Erickson, R. F.	Minneapolis
Ericson, R. M.	Minneapolis
Evans, E. T.	Minneapolis
Evans, R. D.	Minneapolis
Fahr, G. E.	Minneapolis
Fansler, W. A.	Minneapolis
Feeney, J. M.	Minneapolis
Fenger, E. P. K.	Oak Terrace
Fetterly, Warren	Minneapolis
Fink, L. W.	Minneapolis
Fink, W. H.	Minneapolis
Fitzgerald, D. F.	Minneapolis
Fjeldstad, C. A.	Minneapolis
Fleming, A. S.	Minneapolis
Ford, W. H.	Minneapolis
Foster, W. K.	Minneapolis
Fowler, L. H.	Minneapolis
Fredericks, G. M.	Minneapolis
Friedell, Aaron	Minneapolis
Fritzell, K. E.	Minneapolis
Fuller, Alice H.	Minneapolis
Funk, V. K.	Oak Terrace
Gammell, J. H.	Minneapolis
Gardner, E. L.	Minneapolis
Giere, E. O.	Minneapolis
Giere, J. C.	Minneapolis
Giere, R. W.	Minneapolis
Giessler, P. W.	Minneapolis
Gilbert, M. G.	Minneapolis
Gilles, F. L.	Minneapolis
Girvin, R. B.	Minneapolis
Golberg, M. L.	Minneapolis
Goldberg, I. M.	Minneapolis
Goldman, T. I.	Minneapolis
Good, H. D.	Minneapolis
Gordon, P. E.	Minneapolis
Grave, Floyd	Minneapolis
Grimes, Marian	Minneapolis
Gronvall, P. R.	Minneapolis
Gunderson, N. A.	Minneapolis
Gunlaugson, F. G.	Mankato
Gushurst, E. G.	Minneapolis
Gustason, H. T.	Minneapolis
Hacking, F. H.	Minneapolis
Haggard, G. D.	Minneapolis
Hall, J. M.	Minneapolis
Hallberg, C. A.	Minneapolis
Hamel, A. L.	Minneapolis
Hamilton, A. S.	Minneapolis
Hamlin, G. B.	Minneapolis
Hammerstad, L. M.	Minneapolis
Hammond, A. J.	Minneapolis
Hannah, H. B.	Minneapolis
Hansen, C. O.	Minneapolis
Hansen, E. W.	Minneapolis
Hansen, Olga S.	Minneapolis
Hanson, H. J.	Minneapolis
Hanson, H. V.	Minneapolis
Hanson, M. B.	Minneapolis
Hanson, W. A.	Minneapolis
Happe, L. J.	Minneapolis
Harrington, C. D.	Minneapolis
Harrington, F. E.	Minneapolis
Hart, V. L.	Minneapolis
Hartzell, T. B.	Minneapolis
Hastings, D. R.	Minneapolis
Haven, W. K.	Minneapolis
Haverfield, Addie R.	Minneapolis
Hawkinson, R. P.	Minneapolis
Hayes, A. T.	Minneapolis
Hayes, J. M.	Minneapolis
Head, D. P.	Minneapolis
Head, G. D.	Minneapolis
Hedback, A. E.	Minneapolis
Heim, R. R.	Minneapolis
*Helk, H. H.	Minneapolis
Hendricks, E. J.	Minneapolis
Hendrickson, J. F.	Minneapolis
Henrickson, E. C.	Minneapolis
Henry, C. E.	Minneapolis
Henry, M. O.	Minneapolis
Herbolsheimer, A. J.	Minneapolis
Herbst, R. F.	Minneapolis
Herman, A. L.	Minneapolis
Hiebert, J. P.	Minneapolis
Higgins, J. H.	Minneapolis
Hill, Eleanor J.	Minneapolis
Hirschfelder, A. D.	Minneapolis
Hirshfield, F. R.	Minneapolis
Hoaglund, A. W.	Minneapolis
Hobbs, C. A.	Minneapolis
Hodge, S. V.	Minneapolis
Hoffert, H. E.	Minneapolis
Hoffman, R. A.	Minneapolis
Holl, P. M.	Minneapolis
Holmberg, C. J.	Minneapolis
Holt, W. B.	Minneapolis
Holzapfel, F. C.	Minneapolis
Houkom, Bjarne	Minneapolis
Hovland, M. L.	Minneapolis
Huenekens, E. J.	Minneapolis
Hultkrans, J. C.	Minneapolis
Hultkrans, R. E.	Minneapolis
Hurd, Annah	Minneapolis
Hutchinson, C. J.	Minneapolis
Hymes, Charles	Minneapolis
Hynes, J. E.	Minneapolis
Irvine, H. G.	Minneapolis
Jackson, C. M.	Minneapolis
Jennings, Mary H.	Minneapolis
Jensen, Harry	Minneapolis
Jensen, M. J.	Minneapolis
Johnson, A. B.	Minneapolis
Johnson, A. E.	Minneapolis
Johnson, E. W.	Minneapolis
Johnson, H. A.	Minneapolis
Johnson, J. A.	Minneapolis
Johnson, Julius	Minneapolis
Johnson, N. A.	Minneapolis
Johnson, Norman	Minneapolis
Johnson, N. T.	Minneapolis
Johnson, R. A.	Minneapolis
Johnson, R. E.	Minneapolis
Johnson, S. M.	Minneapolis
Johnson, Y. T.	Minneapolis
Jones, G. M.	Minneapolis
Jones, H. W.	Minneapolis
Jones, W. R.	Minneapolis
Josewich, Alexander	Minneapolis
Kalin, O. T.	Minneapolis
Karlstrom, A. E.	Minneapolis
Kelby, G. M.	Minneapolis
Kennedy, C. C.	Minneapolis
Kennedy, Jane F.	Minneapolis
Kerkhof, A. C.	Minneapolis
Kertesz, G.	Minneapolis
Kibbe, O. A.	Minneapolis
King, E. A.	Minneapolis
King, H. T.	Minneapolis
Kinsella, T. J.	Minneapolis
Kistler, A. J.	Minneapolis
Kistler, C. M.	Minneapolis
Knapp, M. E.	Minneapolis
Knight, R. R.	Minneapolis
Knight, R. T.	Minneapolis
Koepcke, G. M.	Minneapolis
Koller, H. M.	Minneapolis
Koller, L. R.	Minneapolis
Korchik, J. P.	Minneapolis
Kucera, F. J.	Hopkins
Kucera, W. J.	Minneapolis
Lajoie, J. M.	Minneapolis
Lang, L. A.	Minneapolis
Lapierre, A. P.	Minneapolis
Lapierre, C. A.	Minneapolis
Lapierre, J. T.	Minneapolis
Larsen, F. W.	Minneapolis
Larson, C. M.	Minneapolis
Larson, L. M.	Minneapolis
Larson, L. M.	Oak Terrace
Larson, P. N.	Minneapolis
La Vake, R. T.	Minneapolis
Laymon, C. W.	Minneapolis
Lazar, H. L.	Minneapolis
Leavitt, H. H.	Minneapolis
Lebowske, J. A.	Minneapolis
Leclercq, G. T. A.	Minneapolis
Lee, H. M.	Minneapolis
Leland, H. R.	Minneapolis
Lenz, O. A.	Minneapolis
Leonard, L. J.	Minneapolis
Leonard, Sam	Minneapolis
Lillehei, E. J.	Robbinsdale
Lind, C. J.	Minneapolis
Lindgren, R. C.	Minneapolis
Lindquist, R. H.	Minneapolis
Linner, H. P.	Minneapolis
Linton, W. B.	Minneapolis
Lippman, E. S.	Minneapolis
Lipschultz, Oscar	Minneapolis
Litchfield, J. T.	Minneapolis
Litman, A. B.	Minneapolis
Litzenberg, J. C.	Minneapolis
Logefeil, R. C.	Minneapolis
Long, Jesse	Minneapolis
Loomis, E. A.	Minneapolis
Lufkin, N. H.	Minneapolis
Lundblad, R. A.	Minneapolis
Lundblad, S. W.	Minneapolis
Lundgren, A. C.	Minneapolis
Lundquist, E. F.	Minneapolis
Lynch, M. J.	Minneapolis
Lysne, Henry	Minneapolis
Lysne, Myron	Minneapolis
MacDonald, A. E.	Minneapolis
MacDonald, D. A.	Minneapolis
*MacDonald, I. C.	Minneapolis
Mach, F. B.	Minneapolis
MacKinnon, D. C.	Minneapolis
Macnie, J. S.	Minneapolis
Maeder, E. C.	Minneapolis
Maland, C. O.	Minneapolis
Mariette, E. S.	Oak Terrace
Mark, D. B.	Minneapolis
Marking, G. H.	Minneapolis
Martinson, C. J.	Wayzata
Matchan, G. R.	Minneapolis
Matthews, Justus	Minneapolis
Mattill, P. M.	Oak Terrace
Mattson, Hamlin	Minneapolis
Maxeiner, S. R.	Minneapolis
May, W. H.	Minneapolis
McCann, E. J.	Minneapolis
McCarthy, Donald	Minneapolis
McCartney, J. S.	Minneapolis
McDaniel, Orianna	Minneapolis
McFarland, A. H.	Minneapolis
McGandy, R. F.	Minneapolis
McGeary, G. E.	Minneapolis
McInerny, M. W.	Minneapolis
McIntyre, George	Minneapolis
McKenzie, C. H.	Minneapolis
McKinlay, C. A.	Minneapolis
McKinley, J. C.	Minneapolis
McKinney, F. S.	Minneapolis
McPheeters, H. O.	Minneapolis
McQuarrie, Irvine	Minneapolis
Meland, F. L.	Minneapolis
Merkert, C. E.	Minneapolis
Merkert, G. L.	Minneapolis
Merrill, Elisabeth	Minneapolis
Meyer, E. L.	Minneapolis
Michael, J. C.	Minneapolis
Michel, H. H.	Minneapolis
Michelson, H. E.	Minneapolis
Miller, H. E.	Minneapolis
Miller, J. C.	Minneapolis
Milton, J. S.	Minneapolis
Mitchell, E. C.	Mound
Moe, J. H.	Minneapolis
Moen, J. K.	Minneapolis
Moir, W. W.	Minneapolis
Monson, E. M.	Minneapolis
Moorhead, Martha B.	Minneapolis
Moren, Edward	Minneapolis
Moriarty, Cecile R.	Minneapolis
Morrison, A. W.	Minneapolis
Morrison, Charlotte J.	Minneapolis
Morse, R. W.	Minneapolis
Morton, H. McI.	Vincentown, N. J.
Murphy, E. P.	Minneapolis
Murphy, I. J.	Minneapolis
Myers, J. A.	Minneapolis
Neal, J. M.	Minneapolis
Neary, R. P.	Minneapolis
Neilson, H. F.	Minneapolis
Nelson, H. S.	Minneapolis
Nelson, Harvey	Minneapolis
Nelson, O. L. N.	Minneapolis
Nelson, W. I.	Minneapolis
Newhart, Horace	Minneapolis
Nordin, G. T.	Minneapolis
Nordland, Martin	Minneapolis
Norris, E. H.	Detroit, Michigan
Noth, H. W.	Minneapolis
Nydahl, M. J.	Minneapolis
Nylander, E. G.	Minneapolis
Nystrom, Ruth	Minneapolis
Oberg, C. M.	Minneapolis
O'Brien, W. A.	Minneapolis
O'Donnell, J. E.	Minneapolis
Olsen, E. G.	Minneapolis
Olson, A. C.	Minneapolis
Olson, F. A.	Minneapolis
Olson, O. A.	Minneapolis
Olson, R. G.	Minneapolis
Oppen, E. G.	Minneapolis
Owre, Oscar	Minneapolis
Patterson, W. E.	Minneapolis
Paulsen, E. L.	Minneapolis
Pederson, R. M.	Minneapolis
Pennington, Reuben	Minneapolis
Peppard, T. A.	Minneapolis
Petersen, J. R.	Minneapolis
Petersen, Thorvald	Minneapolis
Peterson, Henry	Minneapolis
Peterson, H. O.	Minneapolis
Peterson, H. W.	Minneapolis
Peterson, N. P.	Minneapolis
Peterson, O. H.	Minneapolis
Peterson, P. E.	Minneapolis
Peterson, W. C.	Minneapolis
Petit, L. J.	Minneapolis

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*Deceased.

Pettit, C. W.............Minneapolis
Peyton, W. T.............Minneapolis
Pfunder, M. C............Minneapolis
Phelps, K. A.............Minneapolis
Platou, E. S.............Minneapolis
Pohl, J. F...............Minneapolis
Pollard, D. W............Minneapolis
Pollock, D. K............Minneapolis
Polzak, J. A.............Minneapolis
Poppe, F. H..............Minneapolis
Pratt, F. J..............Minneapolis
Pratt, J. A..............Minneapolis
Preine, I. A.............Minneapolis
Prim, J. A...............Minneapolis
Proshek, C. E............Minneapolis

Quello, R. O. B..........Minneapolis
Quinby, T. F...Lake Wales, Florida
Quist, H. W..............Minneapolis

Rasmussen, R. C..........Minneapolis
Reed, C. A...............Minneapolis
Regnier, E. A............Minneapolis
Rewbridge, A. G..........Minneapolis
Reynolds, J. S...........Minneapolis
Rice, C. O...............Minneapolis
Richardson, F. S.........Minneapolis
Richdorf, L. F...........Minneapolis
Rieke, W. W..................Wayzata
Rigler, L. G.............Minneapolis
Risch, R. E..............Minneapolis
Rishmiller, J. H.........Minneapolis
Rizer, R. I..............Minneapolis
Roan, C. M...............Minneapolis
Robb, E. F...............Minneapolis
Robbins, O. F............Minneapolis
Roberts, T. S............Minneapolis
Roberts, W. B............Minneapolis
Robitshek, E. C..........Minneapolis
Rochford, W. E...........Minneapolis
Rodda, F. C..............Minneapolis
Rosen, Samuel............Minneapolis
Rosenwald, R. M..........Minneapolis
Rucker, W. H.............Minneapolis
Rud, N. E................Minneapolis
Rudell, G. L.............Minneapolis
Russeth, A. N............Minneapolis
Rusten, E. M.............Minneapolis

Sadler, W. P.............Minneapolis
St. Cyr, K. J...................Osseo
Salt, C. G...............Minneapolis
Samuelson, Samuel........Minneapolis
Sandt, K. E..............Minneapolis
Sawatzky, W. A...........Minneapolis
Schaaf, F. H. K..........Minneapolis
Schaefer, W. G...........Minneapolis
Scheldrup, N. H..........Minneapolis
Scherer, L. R............Minneapolis
Schiele, B. C............Minneapolis
Schmidt, G. F............Minneapolis
Schmitt, A. F............Minneapolis
Schmitt, S. C.....Los Angeles, Calif.

Schneider, J. P..........Minneapolis
Schottler, M. E..........Minneapolis
Schultz, P. J............Minneapolis
Schussler, O. F..........Minneapolis
Schwartz, V. J...........Minneapolis
Schwyzer, Gustav.........Minneapolis
Scott, F. H..............Minneapolis
Scott, H. G..............Minneapolis
Seashore, Gilbert........Minneapolis
Seham, Max...............Minneapolis
Seifert, M. H..................Excelsior
Seljeskog, S. R..........Minneapolis
Selleseth, I. F..........Minneapolis
Sessions, J. C...........Minneapolis
Shaperman, Eva P.........Minneapolis
Shapiro, M. J............Minneapolis
Sharp, D. V..............Minneapolis
Siegmann, W. C...........Minneapolis
Silver, J. D.............Minneapolis
Simons, J. H.............Minneapolis
Simpson, E. D............Minneapolis
Siperstein, D. M.........Minneapolis
Sivertsen, Andrew..............Mound
Sivertsen, Ivar..........Minneapolis
Skjold, A. C.............Minneapolis
Sloan, Julius............Minneapolis
Smisek, F. M.............Minneapolis
Smith, A. E..............Minneapolis
Smith, A. M..............Minneapolis
Smith, Archie M..........Minneapolis
Smith, H. R..............Minneapolis
Smith, N. M..............Minneapolis
Soderlind, R. T..........Minneapolis
Solhaug, S. B............Minneapolis
Spano, J. P..............Minneapolis
Sperling, Louis..........Minneapolis
Spink, W. W..............Minneapolis
Spratt, C. N.............Minneapolis
Stanford, C. E...........Minneapolis
Stebbins, T. L...........Minneapolis
Stelter, L. A............Minneapolis
Stenstrom, Annette T.....Minneapolis
Stewart, C. A............Minneapolis
Stewart, R. I............Minneapolis
Stomel, Joseph...........Minneapolis
Strachauer, A. C.........Minneapolis
Stromgren, D. T..........Minneapolis
Strout, E. S.............Minneapolis
Strout, G. E.............Minneapolis
Sturre, J. R.............Minneapolis
Sullivan, R. M...........Minneapolis
Sullivan, R. R...........Minneapolis
Sundt, Mathias...........Minneapolis
Swanson, Cephas..........Minneapolis
Swanson, R. E............Minneapolis
Sweetser, H. B., Jr......Minneapolis
Sweetser, H. B., Sr......Minneapolis
Sweetser, T. H...........Minneapolis
Sweitzer, S. E...........Minneapolis
Swendseen, C. G..........Minneapolis

Taylor, J. H.............Minneapolis
Thomas, G. E.............Minneapolis
Thomas, G. H.............Minneapolis
Thomas, G. J.............Minneapolis
Thysell, D. M............Minneapolis
Tingdale, A. C...........Minneapolis
Trueman, H. S............Minneapolis
Tunstead, H. J...........Minneapolis
Turnacliff, D. D.........Minneapolis
Tyrrell, C. C............Minneapolis

Ude, W. H................Minneapolis
Ulrich, H. L.............Minneapolis
Undine, C. A.............Minneapolis

Vik, A. E................Minneapolis

Wahlquist, H. F..........Minneapolis
Walch, A. E..............Minneapolis
Waldron, C. W............Minneapolis
Wall, C. R...............Minneapolis
Wangensteen, O. H........Minneapolis
Wanous, E. Z.............Minneapolis
Ward, A. W...............Minneapolis
Ward, P. A...............Minneapolis
Warham, T. T.............Minneapolis
Watson, C. J.............Minneapolis
Watson, J. A.............Minneapolis
Webb, R. C...............Minneapolis
Weisman, S. A............Minneapolis
Wethall, A. G............Minneapolis
Wetherby, Macnider.......Minneapolis
Weum, T. W...............Minneapolis
White, A. A..............Minneapolis
White, S. M..............Minneapolis
White, W. D..............Minneapolis
Whitesell, L. A..........Minneapolis
Widen, W. F..............Minneapolis
Wilcox, A. E.............Minneapolis
Wilder, K. W.............Minneapolis
Wilder, R. L.............Minneapolis
Wilken, P. A.............Minneapolis
Willcutt, C. E...........Minneapolis
Williams, Robert.........Minneapolis
Winer, L. H..............Minneapolis
Winther, Nora M. C.......Minneapolis
Witham, C. A.............Minneapolis
Wittich, F. W............Minneapolis
Wohlrabe, A. A...........Minneapolis
Wohlrabe, C. F...........Minneapolis
Woodworth, Elizabeth.....Minneapolis
Wright, C. B.............Minneapolis
Wright, C. D.............Minneapolis
Wright, F. R.............Minneapolis
Wright, S. G.............Minneapolis
Wright, W. S.............Minneapolis
Wyatt, O. S..............Minneapolis
Wynne, H. M. N...........Minneapolis

Ylvisaker, R. S..........Minneapolis
Yoerg, O. W..............Minneapolis

Zaworski, E. A...........Minneapolis
Zierold, A. A............Minneapolis
Ziskin, Thomas...........Minneapolis

KANDIYOHI-SWIFT-MEEKER COUNTY MEDICAL SOCIETY

Regular meetings, second Wednesday of month
Annual meeting, December
Number of Members: 32

President
Danielson, Lennox..........Litchfield
Secretary
Scofield, C. L.................Benson

Anderson, R. E................Willmar
Arnson, J. M...................Benson
Branton, A. F.................Willmar
Branton, B. J.................Willmar
Brigham, Frank................Watkins
Daignault, Oscar...............Benson
Danielson, K. A............Litchfield
Danielson, Lennox..........Litchfield
Dowswell, W. J.............Kerkhoven
Frederickson, Alice C.........Willmar
Frederickson, G. U. Y.........Willmar
Frisch, F. P..................Willmar
Frost, E. H...................Willmar
Giere, S. W....................Benson
Hedlund, C. J.................Atwater
Hodapp, R. J..................Willmar
Jacobs, D. L..................Willmar
Jacobs, J. C..................Willmar
Jensen, H. H..................Atwater
Johnson, Hans..............Kerkhoven
Kaufman, W. C................Appleton
Lipp, F. E...................Appleton
Lutz, E. H....................Willmar
Macklin, W. E..............Litchfield
Nelson, K. L.................St. Paul
Petersen, M. C................Willmar
Peterson, S. C.............Grove City
Proeschel, R. K...............Willmar
Scofield, C. L.................Benson
Telford, V. J..............Litchfield
Wilmot, C. A...............Litchfield
Wilmot, H. E...............Litchfield

LYON-LINCOLN COUNTY MEDICAL SOCIETY

Regular meetings, first Tuesday of month Spring and Fall
Annual meeting, first Tuesday in November
Number of Members: 25

President
Johnson, P. C.....................Tyler
Secretary
Workman, W. G.....................Tracy

Akester, Ward...................Marshall
Bossingham, O. N.............Lake Benton
Erickson, A. O...................Ivanhoe
Ford, B. C......................Marshall
Frank, J. E.....................Marshall
Germo, Charles...................Balaton
Gray, F. D......................Marshall
Helferty, J. K.....................Tracy
Hermanson, P. E................Hendricks
Hoidale, A. D......................Tracy
Jacquot, G. L...................Marshall
Johnson, P. C......................Tyler
Monson, L. J.......................Canby
Potter, R. B...................Hendricks
Purves, G. H...............Lake Benton
Robertson, J. B..............Minneapolis
Sanderson, E. T..................Minneota
Schmidt, P. G.................Granite Falls
Smith, L. A......................Balaton
Thordarson, Theodore.............Minneota
Vadheim, A. L......................Tyler
Vadheim, J. L......................Tyler
Valentine, W. H....................Tracy
Workman, W. G......................Tracy
Yaeger, W. W....................Marshall

McLEOD COUNTY MEDICAL SOCIETY

Regular meetings, first Thursday of month
Annual meeting, January
Number of Members: 18

President
Jensen, A. M..............Brownton
Secretary
Sheppard, C. G...........Hutchinson

Clement, J. B..........Lester Prairie
Fine, B. A.................Winsted
Holm, H. H.................Glencoe
Jensen, A. H............Hutchinson
Jensen, A. M..............Brownton
Klima, W. W................Stewart
Langhoff, A. H.............Glencoe
Lippmann, E. W..........Hutchinson
McMahon, M. J..........Green Isle
Ninneman, N. N........Silver Lake
Sahr, W. G..............Hutchinson
Schmidt, W. R..............Glencoe
Scholpp, O. W...........Hutchinson
Sheppard, C. G..........Hutchinson
Sheppard, Fred..........Hutchinson
Sheppard, P. E..........Hutchinson
Tinker, C. W...............Stewart
Trutna, T. J............Silver Lake

MOWER COUNTY MEDICAL SOCIETY

Regular meetings, last Thursday of month excepting June, July and August
Annual meeting, Tuesday before last Thursday in November
Number of Members: 27

President
Hegge, R. S..................Austin
Secretary
Robertson, P. A..............Austin

Allen, A. W..................Austin
Allen, C. C..................Austin
Allen, H. B..................Austin
Cronwell, B. J...............Austin
Flanagan, L. G...............Austin
Grise, W. B..................Austin
Hanson, E. C.................Austin
Havens, J. G. W..............Austin
Hegge, O. H..................Austin
Hegge, R. S..................Austin
Henslin, A. E...............Le Roy
Hertel, G. E.................Austin
Johnson, O. J..................Lyle
Kibler, F. E.................Austin
Leck, P. C...................Austin
Lommen, P. A.................Austin
McKenna, J. K................Austin
Melzer, G. R...................Lyle
Mitchell, R. S.........Grand Meadow
Morrow, J. J.................Austin
Morse, M. P.................Le Roy
Robertson, P. A..............Austin
Rosenthal, F. H.......Grand Meadow
Schneider, P. J...............Adams
Schottler, G. J..............Dexter
Sheedy, C. L.................Austin
Thomson, J. M............Brownsdale

NICOLLET-LE SUEUR COUNTY MEDICAL SOCIETY

Regular meetings, first Tuesday, April, September, and December
Annual meeting, first Tuesday in December
Number of Members: 22

President
Sonnesyn, N. N............Le Sueur
Secretary
Hiniker, P. J.............Le Sueur

Aitkens, H. B............Le Center
Covell, W. W.............St. Peter
Curtis, R. A.............Le Center
Ericson, Swan.............Le Sueur
Freeman, G. H............St. Peter
Grimes, B. P.............St. Peter
Hiniker, P. J.............Le Sueur
Holtan, Theodore........Waterville
Johnson, H. C........North Mankato
Kerschbaumer, Luisa......St. Peter
Kolars, J. J.............Le Center
Lenander, M. E...........St. Peter
Nilson, H. J.........North Mankato
Nissen, A. S.............St. Peter
Olmanson, E. G...........St. Peter
Olson, D. C................Gaylord
Rossen, R. X..............Hastings
Sonnesyn, N. N............Le Sueur
Strathern, C. S..........St. Peter
Strathern, F. P..........St. Peter
Traxler, F. J.............Henderson
Wolner, O. H.............St. Peter

OLMSTED-HOUSTON-FILLMORE-DODGE COUNTY MEDICAL SOCIETY

Regular meetings, first Wednesday every odd month
Annual meeting, November
Number of Members: 407

President
Haines, S. F.............Rochester
Secretary
Anderson, M. J...........Rochester

Adams, R. C..............Rochester
Addington, E. A..........Rochester
Adson, A. W..............Rochester
Affeldt, D. E...............Kasson
Ahlfs, Jacob.............Caledonia
Allen, E. V..............Rochester
Alvarez, W. C............Rochester
Amberg, Samuel...........Rochester
Anderson, M. J...........Rochester
Anderson, N. E.............Harmony
Archer, G. F...........Atlanta, Ga.
Autry, D. H..............Rochester

Baggenstoss, A. H........Rochester
Bagwell, J. S., Jr.......Rochester
Bailey, A. A.............Rochester
Bair, H. L...............Rochester
Baker, G. S..............Rochester
Baker, H. R...............Hayfield
Baker, R. L...............Hayfield
Baker, Theodore, Jr......Rochester
Balfour, D. C............Rochester
Bargen, J. A.............Rochester
Barker, N. W.............Rochester
Barnes, A. R.............Rochester
Basom, W. C..............Rochester
Bedard, R. E........Kankakee, Ill.
Beiswanger, R. H............Wykoff
Beizer, L. H.............Rochester
Belote, G. B.............Caledonia
Benedict, W. L...........Rochester
Bennett, R. L............Rochester
Benson, K. W.............Rochester
Berkman, D. M............Rochester
Berkman, J. M............Rochester
Betlach, C. J........Chicago, Ill.
Bigelow, C. E.........Dodge Center
Binger, M. W.............Rochester
Birge, R. F..............Rochester
Black, B. M..............Rochester
Black, J. R..............Rochester
Boothby, W. M............Rochester
Bowing, H. H.............Rochester
Braasch, W. F............Rochester
Broders, A. C............Rochester
Brown, A. E..............Rochester
Brown, H. A..............Rochester
Brown, H. O..............Rochester
Brown, P. W..............Rochester
Brown, R. W..............Rochester
Browne, H. C., Jr........Rochester
Brumm, H. J..............Rochester
Brunsting, L. A..........Rochester
Buchstein, H. F....New Haven, Conn.
Buie, L. A...............Rochester
Burchell, H. B...........Rochester
Butt, H. R...............Rochester

Cabell, C. L.............Rochester
Cabot, Hugh..............Rochester
Cady, J. B...............Rochester
Cameron, D. M............Rochester
Camp, J. D...............Rochester
Campbell, D. C...........Rochester
Campbell, S. J...........Rochester
Canfield, W. W.............Houston
Carmichael, F. A., Jr....Rochester
Chauncey, L. R...........Rochester
Cherry, J. H.............Rochester
Chew, E. M.....Seattle, Washington
Clagett, O. T............Rochester
Clark, L. W..........Spring Valley
Clark, R. L., Jr.........Rochester
Cleveland, W. H..........Rochester
Clifton, T. A............Chatfield
Colyer, G. E.............Rochester
Comfort, M. W............Rochester
Condon, W. B.............Rochester
Conway, J. F.............Rochester
Cook, E. N...............Rochester
Counseller, V. S.........Rochester
Cragg, R. W..............Rochester
Craig, W. McK............Rochester
Crenshaw, J. L...........Rochester
Crewe, J. E..............Rochester
Cronin, T. D.............Rochester
Crumpacker, L. K.........Rochester
Cusick, P. L.............Rochester
Cutler, H. H.............Rochester

Darling, J. P............Rochester
Davis, A. C..............Rochester
Davis, I. G...............Rushford
Day, Lois................Rochester
Dearing, W. H............Rochester
Delmonico, E. J..........Rochester
Derbyshire, R. C.........Rochester
Desjardins, A. U.........Rochester
Dickson, D. D............Rochester
Dix, C. R................Rochester
Dixon, C. F..............Rochester
Dockerty, M. B...........Rochester
Doehring, P. C...........Rochester
Dolder, F. C.................Eyota
Donath, Douglas..........Rochester
Doss, A. K...............Rochester
Drips, Della G...........Rochester
Dry, T. J................Rochester
Dublin, William..........Rochester

Eaton, L. McK............Rochester
Ecker, A. D..............Rochester
Elkins, E. C.............Rochester
Emmett, J. L.............Rochester
Engle, D. E..............Rochester
Erich, J. B..............Rochester
Erickson, C. O...........Rochester
Evarts, A. B.............Rochester
Eusterman, G. B..........Rochester

Faber, J. E..............Rochester
Fairchild, R. D..........Rochester
Fawcett, C. E.........Stewartville
Ferris, D. O.............Rochester

Figi, F. A.	Rochester
Fisher, H. C.	Rochester
Foley, M. P.	Los Angeles
Fricke, R. E.	Rochester
Friedall, M. T.	Rochester
Gaarde, F. W.	Rochester
Gardner, J. W.	Rochester
Ghormley, R. K.	Rochester
Giffin, H. M.	Rochester
Giffin, H. Z.	Rochester
Giffin, L. A.	Rochester
Good, C. A., Jr.	Rochester
Goodson, W. H., Jr.	Rochester
Gore, H. R.	Rochester
Graham, R. W.	Rochester
Gray, H. K.	Rochester
Greene, L. F.	Rochester
Gregg, R. O.	Rochester
Grindlay, J. H.	Rochester
Groff, J. E.	Rochester
Guernsey, C. M.	Rochester
Habein, H. C.	Rochester
Haines, S. F.	Rochester
Hall, B. E.	Rochester
Hallenbeck, D. F.	Rochester
Hammer, H. J.	Rochester
Hargis, W. H., Jr.	Rochester
Hargraves, M. M.	Rochester
Harrington, S. W.	Rochester
Harrison, M. W.	Rochester
Hartman, H. R.	Rochester
Havens, F. Z.	Rochester
Hawn, H. W.	Rochester
Hayden, R. O.	Rochester
Heck, F. J.	Rochester
Heilman, Dorothy M. H.	Rochester
Heilman, F. R.	Rochester
Helland, G. M.	Spring Grove
Helland, J. W.	Spring Grove
Helm, Standiford	Rochester
Helmholz, H. F.	Rochester
Hempstead, B. E.	Rochester
Hench, P. S.	Rochester
Henderson, J. W.	Rochester
Henderson, M. S.	Rochester
Herrell, W. E.	Rochester
Hertz, C. S.	Rochester
Hewitt, Edith S.	Rochester
Hewitt, R. M.	Rochester
Heyerdale, O. C.	Rochester
Heyerdale, W. W.	Rochester
Hildebrand, Alice G.	Rochester
Hines, E. A., Jr.	Rochester
Hinshaw, H. C.	Rochester
Hodgson, C. H.	Rochester
Hoffmann, H. O. E.	Rochester
Hollister, C. B. H.	Rochester
Holman, J. C., Jr.	Rochester
Horton, B. T.	Rochester
Howell, L. P.	Rochester
Hunt, A. B.	Rochester
Jackman, R. J.	Rochester
Jenovese, J. F.	Rochester
Jensen, R. M.	Rochester
Johnson, H. P.	Harmony
Johnson, R. B.	Lanesboro
Joyce, G. L.	Rochester
Judd, E. S.	Rochester
Jump, W. C.	Kasson
Kearney, R. W.	Rochester
Keating, F. R., Jr.	Rochester
Keith, N. M.	Rochester
Kennedy, R. L. J.	Rochester
Kepler, E. J.	Rochester
Kermott, L. H.	Rochester
Kernohan, J. W.	Rochester
Kershner, C. M.	Rochester
Kierland, R. R.	Rochester
Killins, J. A.	Rochester
Kindschi, Leslie	Rochester
King, W. L. M.	Rochester
Kirklin, B. R.	Rochester
Kirklin, O. L.	Rochester
Koch, Eleanor A. S.	Rochester
Koch, F. L. P.	New York, N. Y.
Koelsche, G. A.	Rochester
Kowallis, G. F.	Rochester
Krusen, Frank	Rochester
Kvale, W. F.	Rochester
Lander, H. H.	Rochester
Lannin, J. C.	Mabel
Leddy, E. T.	Rochester
Leffel, J. M., Jr.	Rochester
Lemon, W. S.	Rochester
Lewis, E. B.	Rochester
Lillie, H. I.	Rochester
Limbert, E. M.	Rochester
Lloyd, S. J.	Rochester
Lochead, D. C.	Rochester
Lockwood, W. W.	Fort Peck, Mont.
Logan, A. H.	Rochester
Logan, G. B.	Rochester
Love, J. G.	Rochester
Lovelace, W. R.	Rochester
Lovelady, S. B.	Rochester
Lundy, J. S.	Rochester
Luden, Georgine	Victoria, B. C., Can.
MacCarty, W. C.	Rochester
Macey, H. B.	Rochester
MacKay, A. R.	Rochester
MacLean, A. R.	Rochester
Madding, G. F.	Rochester
Magath, T. B.	Rochester
Mann, A. S., Jr.	Rochester
Mann, F. C.	Rochester
Marcley, D. M.	Amarillo, Texas
Marshall, Mary E.	Rochester
Masson, D. M.	Rochester
Masson, J. C.	Rochester
Matthews, M. W.	Rochester
Mayo, C. H.	Rochester
Mayo, C. W.	Rochester
Mayo, W. J.	Rochester
Maytum, C. K.	Rochester
McCullough, J. A. L.	Rochester
McDonald, J. R.	Rochester
McDonough, F. E.	Rochester
McKaig, C. B.	Pine Island
McKean, R. S.	Rochester
McKinnon, D. A., Jr.	Rochester
McManamy, E. P.	Rochester
Mecray, P. M., Jr.	Rochester
Merritt, W. A.	Rochester
Meyerding, H. W.	Rochester
Miller, J. M.	Rochester
Moersch, F. P.	Rochester
Moersch, H. J.	Rochester
Montgomery, Hamilton	Rochester
Morissette, Leopold	Rochester
Morlock, C. G.	Rochester
Mountain, G. E.	Rochester
Mousel, L. H.	Rochester
Mulrooney, R. E.	Rochester
Mundell, B. J.	Washington, D. C.
Munn, Elizabeth L.	Rochester
Mussey, R. D.	Rochester
Nash, L. A.	Rochester
Nass, H. A.	Mabel
Neel, H. B.	Rochester
Nesbitt, Samuel	Rochester
New, G. B.	Rochester
Norris, N. T.	Caledonia
O'Brien, J. P.	Rochester
Odel, H. M.	Rochester
Olds, J. W.	Rochester
O'Leary, P. A.	Rochester
Olsen, A. M.	Rochester
Olson, E. A.	Pine Island
Olson, G. E.	West Concord
Onsgard, L. K.	Houston
Overpeck, D. O.	Rochester
Pansch, F. N.	Rochester
Parker, R. L.	Rochester
Parkhill, Edith M.	Rochester
Pastore, P. N.	Rochester
Patton, G. D.	Rochester
Paulson, D. L.	Rochester
Paulson, J. A.	Rochester
Pearman, R. O. D.	Rochester
Pemberton, J. deJ.	Rochester
Perozzi, Thelma	Rochester
Piper, M. C.	Rochester
Plummer, W. A.	Rochester
Pollock, G. A.	Rochester
Pollock, L. W.	Rochester
Pool, T. L.	Rochester
Popp, W. C.	Rochester
Powers, F. H.	Rochester
Prangen, A. D.	Rochester
Prickman, L. E.	Rochester
Priestley, J. T.	Rochester
Pugh, D. G.	Rochester
Pumphrey, R. E.	Rochester
Quade, R. H.	Rochester
Quill, T. H.	Rochester
Ralph, R. D.	Rochester
Randall, K. C., II	Rochester
Randall, L. M.	Rochester
Rasmussen, T. B.	Rochester
Redding, M. D.	Rochester
Regan, J. F.	Rochester
Rein, G. N.	Rochester
Richardson, W. E.	Rushford
Risser, A. F.	Stewartville
Rivers, A. B.	Rochester
Robertson, H. E.	Rochester
Rogne, W. G.	Spring Grove
Rosenberg, E. F.	Rochester
Rosenow, E. C.	Rochester
Rosenow, E. C., Jr.	Rochester
Rosentiel, H. C.	Rochester
Rucker, C. W.	Rochester
Rushton, J. G.	Rochester
Rutledge, D. I.	Rochester
Rynearson, E. H.	Rochester
Sanford, A. H.	Rochester
Sawyer, Malcolm	Rochester
Schlicke, C. P.	Rochester
Schmidt, H. W.	Rochester
Schmitt, G. F., Jr.	Rochester
Schneider, H. H.	Rochester
Schulte, T. L.	Rochester
Schunke, G. B.	Rochester
Schweiger, L. R.	Rochester
Searles, P. W.	Buffalo, N. Y.
Secord, E. N.	Rochester
Seedorf, E. E.	Rochester
Seldon, T. H.	Rochester
Sharpe, W. S.	Rochester
Sheedy, L. P.	Rochester
Shelden, W. D.	Rochester
Sheldon, C. H.	Rochester
Shepard, V. D.	Rochester
Shoemaker, Rosemary	Des Moines, Ia.
Sickler, J. R.	Rochester
Simonton, K. M.	Rochester
Skinner, I. C., Jr.	Rochester
Slocumb, C. H.	Rochester
Smith, B. F.	Rochester
Smith, C. H.	New Hampton, Iowa
Smith, F. D.	Rochester
Smith, F. A.	Rochester
Smith, F. L.	Rochester
Smith, H. L.	Rochester
Smith, K. A.	Rochester
Smith, L. A.	Rochester
Smith, N. D.	Rochester
Smith, R. L., Jr.	Rochester
Snell, A. M.	Rochester
Snyder, J. M.	Rochester
Soniat, T. L. L.	Rochester
Sprague, R. G.	Rochester
Squire, E. W.	Rochester
Stafford, D. E.	Rochester
Stalker, L. K.	Rochester
Steffens, L. F.	Rochester
Stickney, J. M.	Rochester
Stuhler, L. G.	Rochester
Sutherland, C. G.	Rochester
Swartz, F. C.	Rochester
Swift, E. V.	Rochester
Swingle, H. F., Jr.	Rochester
Tenner, R. J.	Rochester
Tennison, William, III	Rochester
Thigpen, F. M.	Rochester
Thompson, G. J.	Rochester
Tierney, C. M.	Harmony
Tillisch, J. H.	Rochester
Tooke, T. B., Jr.	Rochester
Trandem, C. Elinor	Rochester
Trueman, K. R.	Rochester
Tuohy, E. B.	Rochester
Uihlein, Alfred	Rochester
Usher, F. C.	Rochester
Vaughn, L. D.	Rochester
Vickers, P. M.	Rochester
Wagener, H. P.	Rochester
Waggoner, R. P.	Rochester
Waisman, Morris	Rochester
Wakefield, E. G.	Rochester
Walsh, J. J.	Rochester
Walsh, M. N.	Rochester
Walters, Waltman	Rochester
Ward, C. E.	Jackson, Miss.
Watkins, C. H.	Rochester
Watterson, K. W.	Meadville, Pa.
Waugh, J. M.	Rochester
Weaver, D. F., Jr.	Rochester
Weber, H. M.	Rochester
Weir, J. F.	Rochester
Westra, J. J.	Rochester
Wilcox, L. E.	Rochester
Wilder, R. M.	Rochester
Williams, H. L.	Rochester
Williams, R. V.	Rushford
Willius, F. A.	Rochester
Willson, D. M.	Rochester
Wilson, L. B.	Rochester
Wilson, R. B.	Rochester
Wilson, W. D.	Rochester
Woltman, H. W.	Rochester
Wood, H. G.	Rochester
Woodruff, C. W.	Chatfield
Woodruff, Robert	Rochester
Wrork, D. H.	Rochester
Wulf, R. F.	Rochester
Yeager, C. L.	Rochester
Young, H. H.	Rochester

PARK REGION DISTRICT AND COUNTY MEDICAL SOCIETY

Douglas, Grant, Otter Tail and Wilkin Counties
Regular meetings, Second Wednesday every other month
Annual meeting, December
Number of Members: 56

President

Baker, N. H.	Fergus Falls

Secretary

Boline, C. A.	Battle Lake

Ahrens, R. S.	Fergus Falls
Arndt, H. W.	Detroit Lakes
Baker, A. C.	Fergus Falls
Baker, N. H.	Fergus Falls
Bergquist, K. E.	Battle Lake
Blakey, A. R.	Osakis
Boline, C. A.	Battle Lake
Boyd, L. M.	Alexandria
Boysen, J. E.	Pelican Rapids
Boysen, Peter	Pelican Rapids
Broker, W. S.	Wadena
Burnap, W. L.	Fergus Falls
Clifford, G. W.	Alexandria
Combacker, L. C.	Fergus Falls
Drought, W. W.	Fergus Falls
Esser, John	Perham
Estrem, C. O.	Fergus Falls
Fisher, J. M.	Fergus Falls
Griswold, F. E.	Hoffman
Hand, W. R.	Elbow Lake
Hanson, E. C.	New York Mills
Haskell, A. D.	Alexandria
Heiberg, E. A.	Fergus Falls
Jacobs, G. C.	Fergus Falls
Johnson, O. V.	Fergus Falls
Katzberg, L. W.	Fergus Falls
Kierland, P. E.	Alexandria
Lee, W. A.	Fergus Falls
Leibold, H. H.	Parkers Prairie
Leland, J. T.	Herman
Lewis, A. J.	Henning
Love, F. A.	Carlos
Lund, C. J. T.	Underwood
McMahon, L. H.	Breckenridge
Miller, W. A.	New York Mills
Mouritsen, G. J.	Fergus Falls
Naegeli, Frank	Fergus Falls
Nelson, W. O. B.	Fergus Falls
Otto, H. C.	Frazee
Parson, L. R.	Elbow Lake
Patterson, W. L.	Fergus Falls
Paulson, T. S.	Fergus Falls
Powers, F. W.	Barrett
Randall, A. M.	Ashby
Reeve, E. T.	Elbow Lake
Rimer, E. W.	Breckenridge
Satersmoen, Theodore	Pelican Rapids
Sather, E. R.	Alexandria
Serkland, J. C.	Rothsay
Stemsrud, H. L.	Parkers Prairie
Sutton, H. R.	Hoffman
Tanquist, E. J.	Alexandria
Vail, J. B.	Henning
Webster, L. J.	Battle Lake
Windsor, R. L.	Fergus Falls
Wray, W. E.	Campbell

RAMSEY COUNTY MEDICAL SOCIETY

Regular meetings, last Monday in every month excepting June, July, August
Annual meeting, last Monday in January
Number of Members: 346

President

Schoch, R. B. J.	St. Paul

Secretary

Wilson, J. A.	St. Paul

Abbott, J. S.	St. Paul
Ahrens, A. E.	St. Paul
Ahrens, A. H.	St. Paul
Alberts, M. W.	St. Paul
Alden, J. F.	St. Paul
Alexander, F. H.	St. Paul
Armstrong, J. M.	St. Paul
Arnquist, A. S.	St. Paul
Aurelius, J. R.	St. Paul
Ausman, C. F.	St. Paul
*Backus, A. S.	St. Paul
Bacon, D. K.	St. Paul
Bacon, L. C.	St. Paul
Balcome, M. M.	St. Paul
Barry, L. W.	St. Paul
Barsness, Nellie	St. Paul
Beadie, W. D.	Cannon Falls
Beals, Hugh	St. Paul
Beech, R. H.	St. Paul
Beek, H. O.	St. Paul
Bell, C. C.	St. Paul
Benepe, J. L.	St. Paul
Bennion, P. H.	St. Paul
Bentley, N. P.	St. Paul
Berrisford, P. D.	St. Paul
Bicek, J. F.	St. Paul
Binger, H. E.	St. Paul
Birnberg, T. L.	St. Paul
Bock, R. A.	St. Paul
Boeckmann, Egil	St. Paul
Bohland, E. H.	St. Paul
Bolender, H. L.	St. Paul
Borg, J. F.	St. Paul
Bouma, L. R.	St. Paul
Brand, G. D.	St. Paul
Bray, E. R.	St. Paul
Briggs, J. F.	St. Paul
Broadie, T. E.	St. Paul
Brodie, W. D.	St. Paul
Brown, E. I.	St. Paul
Brown, J. C.	St. Paul
Bulinski, T. J.	St. Paul
Burch, E. P.	St. Paul
Burch, F. E.	St. Paul
Burns, R. M.	St. Paul
Burton, C. G.	St. Paul
Busher, H. H.	St. Paul
Cain, C. L.	St. Paul
Caldwell, J. P.	St. Paul
Carroll. W. C.	St. Paul
Chatterton, C. C.	St. Paul
Christiansen, A.	St. Paul
Christison, J. T.	St. Paul
Clark, H. B., Jr.	St. Paul
Clark, T. C.	Minneapolis
Colby, Woodard	St. Paul
Cole, W. H.	St. Paul
Collie, H. G.	St. Paul
Colvin, A. R.	St. Paul
Connor, C. E.	St. Paul
Cook, C. K.	St. Paul
Cooper, C. C.	St. Paul
Countryman, R. S.	St. Paul
Cowern, E. W.	North St. Paul
Critchfield, L. R.	St. Paul
Culligan, J. M.	St. Paul
Dack, L. G.	St. Paul
Daugherty, E. B.	Marine-on-St. Croix
Daugherty, L. E.	St. Paul
Davis, Herbert	St. Paul
Davis, William	St. Paul
Dedolph, Karl	St. Paul
Delavan, P. A.	St. Paul
Derauf, B. I.	St. Paul
Dickson, T. H.	St. Paul
Dittman, G. C.	St. Paul
Donohue, P. F.	St. Paul
Dovre, C. M.	St. Paul
Drake, C. B.	St. Paul
Dunn, J. N.	St. Paul
Earl, G. A.	St. Paul
Earl, John	St. Paul
Earl, Robert	St. Paul
Edlund, G.	St. Paul
Edwards, J. W.	St. Paul
Edwards, T. J.	St. Paul
Ely, O. S.	South St. Paul
Emerson, E. C.	St. Paul
Endress, E. K.	St. Paul
Ernest, G. C.	South St. Paul
Eshelby, E. C.	St. Paul
Fahey, E. W.	St. Paul
Ferguson, J. C.	St. Paul
Fesler, H. H.	St. Paul
Flanagan, H. F.	St. Paul
Fogarty, C. W.	St. Paul
Fogelberg, E. J.	St. Paul
Foley, F. E. B.	St. Paul
Freeman, C. D.	St. Paul
Freidman, L. L.	St. Paul
Fritz, W. L.	St. Paul
Froats, C. W.	St. Paul
Gager, E. C.	St. Paul
Garbrecht, Arthur	St. Paul
Gardiner, D. G.	St. Paul
Geer, E. K.	St. Paul
Gehlen, J. N.	St. Paul
Ghent, C. H.	St. Paul
Gibbs, E. C.	St. Paul
Gilfillan, J. S.	St. Paul
Gilkey, S. E.	St. Paul
Ginsberg, Wm.	St. Paul
Goltz, E. V.	St. Paul
Grant, H. W.	St. Paul
Gratzek, Thomas	St. Paul
Grau, R. K.	St. Paul
Greenberg, H. A.	St. Paul
Gruenhagen, A. P.	St. Paul
Hagaman, G. K.	St. Paul
Hall, A. R.	St. Paul
Hall, H. H.	St. Paul
Hammes, E. M.	St. Paul
Hammond, J. F.	St. Paul
Hanson, H. B.	St. Paul
Harmon, G. E.	St. Paul
Hartfiel, W. F.	St. Paul
Hartley, E. C.	St. Paul
Hassett, M. F.	St. Paul
Hauser, V. P.	St. Paul
Hawkins, V. J.	St. Paul
Heath, A. C.	Stillwater
Heck, W. W.	St. Paul
Hedenstrom, F. G.	St. Paul
Hengstler, W. H.	St. Paul
Hensel, C. N.	St. Paul
Herman, Samuel	St. Paul
Heron, R. C.	St. Paul
Herrmann, E. T.	St. Paul
Hilger, A. W.	St. Paul
Hilger, D. D.	St. Paul
Hilger, L. A.	St. Paul
Hilleboe, H. E.	St. Paul
Hiniker, L. P.	St. Paul
Hochfilzer, J. J.	St. Paul
Hoff, Alfred	St. Paul
Hoffman, M. H.	St. Paul
Holcomb, J. T.	St. Paul
Holcomb, O. W.	St. Paul
Holmen, R. W.	St. Paul
Holt, J. E.	St. Paul
Hopkins, G. W.	St. Paul
Howard, M. A.	St. Paul
Howard, W. S.	St. Paul
Hullsiek, R. B.	St. Paul
Ide, A. W.	St. Paul
Ikeda, Kano	St. Paul
Ingerson, C. A.	St. Paul
Jesion, J. W.	St. Paul
Johanson, W. G.	St. Paul
Johnson, A. M.	St. Paul
Johnson, J. A.	St. Paul
Johnson, T. H.	San Francisco, Calif.
Jones, E. M.	St. Paul
Kamman, G. R.	St. Paul
Kannary, E. L.	St. Paul
Kaplan, D. H.	St. Paul
Kasper, E. M.	St. Paul
Keefe, Rolland	St. Paul
Kelly, J. V.	St. Paul
Kelly, P. H.	St. Paul
Kenefick, E. V.	St. Paul
Kennedy, W. A.	St. Paul
Kesting, Herman	St. Paul
King, G. L.	St. Paul
Klein, H. N.	St. Paul
Knauff, M. K.	St. Paul
Koepsell, A. A. H.	St. Paul
Kugler, A. A.	St. Paul
Kvitrud, Gilbert	St. Paul
Langenderfer, F. V.	St. Paul
Larsen, C. L.	St. Paul
Lax, M. H.	St. Paul
Leahy, Bartholomew	St. Paul
Leavenworth, R. O.	St. Paul
Leick, R. M.	St. Paul
Leitch, Archibald	St. Paul
Lepak, J. A.	St. Paul

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*Deceased.

Lerche, William..........Cable, Wis.
Leven, N. L..................St. Paul
Levin, Bert..................St. Paul
Levitt, G. X..................St. Paul
Lick, C. L....................St. Paul
Lippman, H. S.................St. Paul
Little, W. J..................St. Paul
Livingstone, J. W.......Hudson, Wis.
Lowe, E. R...........South St. Paul
Lowe, T. A...........South St. Paul
Lundholm, A. M................St. Paul
Lynch, F. W...................St. Paul

Madden, J. F..................St. Paul
Markoe, J. C..................St. Paul
Marks, R. W...................St. Paul
Martineau, J. L...............St. Paul
Mattson, C. H.................St. Paul
McCarthy, J. J................St. Paul
McCarthy, W. R................St. Paul
McClanahan, J. H.........White Bear
McClanahan, T. S.........White Bear
McLaren, Jennette M.....Minneapolis
McNevin, C. F.................St. Paul
Meade, J. R...................St. Paul
Mears, B. J...................St. Paul
Medelman, J. P................St. Paul
Meyerding, E. A...............St. Paul
Moga, J. A....................St. Paul
Mogilner, J. N.....Los Angeles, Calif.
Molander, H. A................St. Paul
Moquin, Marie A...............St. Paul
Moran, T. R...........Phoenix, Ariz.
Moriarty, Berenice............St. Paul
Morrissey, F. B...............St. Paul
Moss, M. N....................St. Paul
Moynihan, T. J................St. Paul
Muller, R. T..................St. Paul
Myers, Thomas.................St. Paul

Naegeli, A. E.................St. Paul
Naslund, A. W.................St. Paul
Neher, F. H...................St. Paul
Nelson, L. A..................St. Paul
Nichols, A. E.................St. Paul
Noble, J. F...................St. Paul
Noble, J. L...................St. Paul
Nuebel, C. J..................St. Paul
Nye, Katherine A..............St. Paul
Nye, Lillian L................St. Paul

O'Brien, W. M.................St. Paul
O'Connor, L. J................St. Paul
Oerting, Harry................St. Paul
Ogden, Warner.................St. Paul
Ohage, Justus, Jr.............St. Paul

Olson, C. A...................St. Paul
O'Reilley, B. E...............St. Paul
Ostergren, E. W...............St. Paul
Ouelette, A. J................St. Paul

Page, C. V....................St. Paul
Pearson, F. R.................St. Paul
Pedersen, A. H................St. Paul
Perry, C. G...................St. Paul
Peterson, D. B................St. Paul
Peterson, J. L. E.............St. Paul
Peterson, V. N................St. Paul
Plondke, F. J.................St. Paul
Prendergast, H. J.............St. Paul
Prendergast, J. J.............St. Paul

Radabaugh, R. C.............Hastings
Ramsey, W. R..................St. Paul
Richards, E. T. F.............St. Paul
Richardson, H. E..............St. Paul
Ritchie, H. P.................St. Paul
Ritchie, W. P.................St. Paul
Ritt, A. E....................St. Paul
Rogers, S. F..................St. Paul
Rosenbladt, Louis.............St. Paul
Rosenholtz, Burton............St. Paul
Rosenthal, Robert.............St. Paul
Rothrock, J. L................St. Paul
Rothschild, H. J..............St. Paul
Roy, P. C.....................St. Paul
Ruhberg, G. N.................St. Paul
Rutherford, W. C..............St. Paul
Ryan, J. J....................St. Paul
Ryan, J. M....................St. Paul
Ryan, M. E....................St. Paul

Sarnecki, M. M................St. Paul
Satterlund, V. L..............St. Paul
Savage, F. J..................St. Paul
Schoch, R. B. J...............St. Paul
Schons, Edward................St. Paul
Schuldt, F. C.................St. Paul
Schulze, A. G.................St. Paul
Schwyzer, Arnold..............St. Paul
Scott, E. E...................St. Paul
Senkler, G. E.................St. Paul
Setzer, H. J..................St. Paul
Shannon, W. R.................St. Paul
Shellman, J. L................St. Paul
Shillington, M. A.....Glendive, Mont.
Shimonek, S. W................St. Paul
Short, Jacob..................St. Paul
Simons, L. T..................St. Paul
Singer, B. J..................St. Paul
Skinner, H. O.................St. Paul
Smisek, E. A..................St. Paul

Smith, V. D. E................St. Paul
Snyder, G. W..................St. Paul
Sohlberg, O. I................St. Paul
Souster, B. B.................St. Paul
Sprafka, J. M.................St. Paul
Steinberg, C. L...............St. Paul
Sterner, E. G.................St. Paul
Sterner, E. R.................St. Paul
Stewart, Alexander............St. Paul
Stinnette, S. E...............St. Paul
Stoeckmann, A. E..............St. Paul
Stolpestad, A. H..............St. Paul
Stolpestad, H. L..............St. Paul
Strate, G. E..................St. Paul
Strauss, M. L.................St. Paul
Swanson, J. A.................St. Paul
Swendson, J. J................St. Paul

Teisberg, C. B................St. Paul
Thompson, F. A................St. Paul
Thoreson, M. O................St. Paul
Tifft, C. R...................St. Paul
Tregilgas, H. R.........South St. Paul
Van Slyke, C. A...............St. Paul
Veirs, Dean...................St. Paul
Veirs, Ruby S.................St. Paul
Venables, A. E................St. Paul
Von der Weyer, William........St. Paul
Waas, C. W....................St. Paul
Walker, A. E..................St. Paul
Walter, C. W..................St. Paul
Warnock, R. W.................St. Paul
Warren, C. A..................St. Paul
Warren, E. L..................St. Paul
Watz, C. E....................St. Paul
Welch, M. C...................St. Paul
Wenzel, G. P..................St. Paul
Werner, O. S................Cambridge
Wheeler, M. W.................St. Paul
Whitacre, J. C................St. Paul
Whitmore, F. W................St. Paul
Williams, A. B................St. Paul
Williams, C. K................St. Paul
Williamson, G. A..............St. Paul
Wilson, J. A..................St. Paul
Wilson, J. V..................St. Paul
Winnick, J. B.................St. Paul
Wold, K. C....................St. Paul
Wolfe, H. H...................St. Paul
Wolff, H. J...................St. Paul
Wolkoff, H. J.................St. Paul
Youngren, E. R................St. Paul
Zachman, L. L.................St. Paul
Zander, C. H..................St. Paul
Zimmermann, H. B..............St. Paul

RED RIVER VALLEY MEDICAL SOCIETY

Kittson, Mahnomen, Marshall, Norman, Pennington, Polk, Red Lake and Roseau Counties
Regular meetings, second Tuesday every quarter
Annual meeting, second Tuesday, December
Number of Members: 62

President
Erickson, Eskil...............Halstad

Secretary
Oppegaard, C. L............Crookston

Adkins, C. M........Thief River Falls
Anderson, W. E.....Thief River Falls
Anderson, W. S...........Minneapolis
Behr, O. K.................Crookston
Berge, D. O...................Roseau
Berlin, A. S.................Hallock
Bertelson, O. L............Crookston
Biedermann, Jacob..Thief River Falls
Blegen, H. M..................Warren
Bloedel, T. J.......Thief River Falls
Boardman, D. V.........Twin Valley
Bohl, G. W.......................Ada
Borreson, Baldwin...Thief River Falls
Bratrud, Edward....Thief River Falls
Brink, A. A.................Baudette
Brown, L. L................Crookston
Delmore, J. L., Jr............Roseau

Delmore, J. L., Sr............Roseau
Ederer, J. J...............Mahnomen
Erickson, Eskil..............Halstad
Griffin, P. J.................Fertile
Haugseth, Enoch.........Twin Valley
Hedemark, H. H.....Thief River Falls
Helseth, H. K.......Thief River Falls
Henney, W. H...............McIntosh
Hodgson, H. H..............Crookston
Hollands, W. H..................Fisher
Holmstrom, C. H...............Warren
Johnson, H. C.......Thief River Falls
*Kahala, Arthur............Crookston
Kirk, G. P..........East Grand Forks
Knutson, G. A..............Greenbush
Kostick, W. R.................Fertile
Leitch, N. M..................Warroad
Loken, Theodore....................Ada
Lynde, O. G.........Thief River Falls
Malloy, J. F.........Thief River Falls
Mellby, O. F.........Thief River Falls
Mercil, W. F................Crookston
Morley, G. A................Crookston

Nelson, H. E................Crookston
Norman, J. F................Crookston
Ohnstad, J. L................McIntosh
Oppegaard, C. L............Crookston
Oppegaard, M. O...........Crookston
Paradis, W. G..............Crookston
Parsons, J. G...............Crookston
Pellettiere, E. V.....Thief River Falls
Reff, A. R..................Crookston
Rice, H. R......................Roseau
Robertson, F. O.....East Grand Forks
Roy, J. A.............Red Lake Falls
Sather, G. O...................Fosston
Sather, R. O................Crookston
Shaleen, A. W.................Hallock
Shedlov, Abraham.............Fosston
Stevens, John.................Gonvick
Stocking, F. F.................Hallock
Stuurmanns, S. H..............Erskine
Tanglin, W. G. L..........Mahnomen
Torgerson, W. B...............Oklee
Uhley, C. G.................Crookston
Wiltrout, I. G......................Oslo

REDWOOD-BROWN COUNTY MEDICAL SOCIETY

Regular meetings, February, May, August, and November
Annual meeting, May
Number of Members: 31

President
Nuessle, W. G..............Springfield

Secretary
Fritsche, C. J...............New Ulm

Abbott, C. B...............Springfield
Anderson, E. M.............Lamberton
Brey, F. W...................Wabasso
Cairns, R. J...................Sanborn
Dubbe, F. H.................New Ulm
Dysterheft, A. F..............Gaylord
Esser, O. J....................Gibbon

Fesenmaier, O. B............New Ulm
Fritsche, Albert.............New Ulm
Fritsche, C. J...............New Ulm
Fritsche, T. R...............New Ulm
Gibbons, F. C.................Comfrey
Goblirsch, A. P...........Sleepy Eye

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*Deceased.

Hammermeister, T. F.	New Ulm
Hovde, Rolf	Winthrop
Kusske, A. L.	New Ulm
Mortensbak, H. E.	Hanska
Nuessle, W. G.	Springfield
Olson, K. L.	Gibbon
Pelant, F. J.	New Ulm
Peterson, R. A.	Vesta
Reineke, G. F.	New Ulm
Rothenburg, J. C.	Springfield
Saffert, C. A.	New Ulm
Schroeppel, J. E.	Winthrop
Seifert, O. J.	New Ulm
Vogel, H. A. L.	New Ulm
Vogel, J. H.	New Ulm
Wahlberg, E. W.	Morgan
Weiser, G. B.	New Ulm
Wohlrabe, E. J.	Springfield

RENVILLE COUNTY MEDICAL SOCIETY

Regular meetings, second Tuesday of each month
Annual meeting, November
Number of Members: 24

President	
Gaines, E. C.	Buffalo Lake
Secretary	
Billings, R. E.	Franklin
Adams, R. C.	Bird Island
Billings, R. E.	Franklin
Brand, W. A.	Redwood Falls
Bushard, W. J.	Bird Island
Ceplecha, S. F.	Redwood Falls
Cole, H. B.	Redwood Falls
Cole, J. G.	Redwood Falls
Cosgriff, J. A.	Olivia
Dordal, J.	Sacred Heart
Erickson, R. E.	Hector
Fawcett, A. M.	Renville
Flinn, T. E.	Redwood Falls
Gaines, E. C.	Buffalo Lake
Hartmann, C. M.	Fairfax
Johnson, O. H.	Redwood Falls
Johnson, W. E.	Morgan
Lenz, J. R.	Morton
Madland, R. S.	Fairfax
Mesker, G. H.	Olivia
Passer, A. A.	Olivia
Penhall, F. W.	Morton
Potthoff, C. J.	Minneapolis
Preisinger, J. W.	Renville
Solsem, F. N.	Sacred Heart

RICE COUNTY MEDICAL SOCIETY

Regular meetings, at call
Annual meeting, December
Number of Members: 37

President	
Robilliard, C. M.	Faribault
Secretary	
Plonske, C. J.	Faribault
Babcock, F. M.	Northfield
Beede, Ethel R.	Faribault
Dugan, L. F.	Faribault
Dungay, N. S.	Northfield
Engberg, E. J.	Faribault
Francis, D. W.	Morristown
Haessly, S. B.	Faribault
Hanson, A. M.	Faribault
Haynes, A. L.	Faribault
Huxley, F. R.	Faribault
Kanne, C. W.	Faribault
Lende, Norman	Faribault
Lexa, F. J.	Lonsdale
Lufkin, C. D.	Northfield
Lyght, C. E.	Northfield
McKeon, J. O.	Montgomery
Meyer, F. C.	Kenyon
Meyer, P. F.	Faribault
Moses, Joseph, Jr.	Northfield
Moyer, R. E.	Faribault
Nuetzman, A. W.	Faribault
Plonske, C. J.	Faribault
Robilliard, C. M.	Faribault
Rohrer, C. A.	Waterville
Rudie, C. N.	Kenyon
Rumpf, C. W.	Faribault
Rumpf, W. H.	Faribault
Seeley, I. F.	Northfield
Stewart, Gwendolyn	Faribault
Stroebel, C. F.	Northfield
Thorson, O. P.	Northfield
Traeger, C. A.	Faribault
Warren, F. S.	Washington, D. C.
West, E. J.	Faribault
Wilkowske, R. J.	Nerstrand
Wilson, Warren	Northfield
Wylie, A. R. T.	Faribault

ST. LOUIS COUNTY MEDICAL SOCIETY

Carlton, Cook, Itasca, Lake and St. Louis Counties
Regular meetings, second Thursday every month except July and August
Annual meeting, December
Number of Members: 223

President	
Clement, T. G.	Duluth
Secretary	
MacRae, G. C.	Duluth
Abraham, A. L.	Duluth
Adams, B. S.	Hibbing
Addy, E. R.	Gilbert
Ahl, C. W.	Hibbing
Akins, W. M.	Eveleth
Anderson, H. R.	Deer River
Armstrong, E. L.	Duluth
Arnold, J. E.	Mountain Iron
Athens, A. G.	Duluth
Ayres, G. T.	Ely
Bachnik, F. W.	Hibbing
Bagley, C. M.	Duluth
Bagley, Elizabeth C.	Duluth
Bagley, W. R.	Duluth
Bakkila, Henry	Duluth
Bardon, Richard	Duluth
Barney, L. A.	Duluth
Barrett, E. E.	Duluth
Becker, F. T.	Duluth
Bender, J. H.	Big Fork
Berdez, G. L.	Duluth
Bianco, A. J.	Duluth
Binet, H. E.	Grand Rapids
Birkland, O. N.	Hibbing
Blacklock, S. S.	Hibbing
Blakely, C. C.	Barnum
Boman, P. G.	Duluth
Bowen, R. L.	Hibbing
Boyer, S. H., Jr.	Duluth
Boyer, S. H., Sr.	Duluth
Braverman, N. J.	Duluth
Bray, P. N.	Duluth
Bray, R. B.	Biwabik
Buckley, R. P.	Duluth
Burton, J. L.	Buhl
Butler, J. K.	Carlton
Cantwell, W. F.	International Falls
Carstens, C. F.	Hibbing
Chapman, T. L.	Duluth
Cheney, E. L.	Duluth
Chermak, F. G.	Hibbing
Christensen, E. P.	Two Harbors
Clark, F. F.	Duluth
Clement, T. G.	Duluth
Cochrane, B. B.	Coleraine
Collins, A. N.	Duluth
Collins, H. C.	Duluth
Coventry, W. A.	Duluth
Coventry, W. D.	Duluth
Cowan, G. M.	Brimson
Dahlin, I. T.	Aurora
Davies, R. J.	Nopeming
Davis, B. F.	Duluth
Doolittle, L. E.	Duluth
Doyle, G. C.	Duluth
Eckman, P. F.	Duluth
Eckman, R. J.	Duluth
Ekblad, J. W.	Duluth
Elias, F. J.	Duluth
Elliott, W. S.	Virginia
Emanuel, K. W.	Duluth
Eppard, R. M.	Cloquet
Estrem, T. A.	Hibbing
Ewens, H. B.	Virginia
Fankboner, A. V.	Buhl
Fawcett, K. R.	Duluth
Fellows, M. F.	Duluth
Feuling, J. C.	Bovey
Fischer, M. McC.	Duluth
Fisketti, Henry	Duluth
Forbes, R. S.	Duluth
Gendron, J. F.	Grand Rapids
Gillespie, M. G.	Duluth
Gillespie, N. H.	Duluth
Giroux, A. A.	Moose Lake
Goldish, D. R.	Duluth
Goodman, C. E.	Virginia
Gowan, L. R.	Duluth
Graham, Robert	Duluth
Graves, W. N.	Duluth
Haney, C. L.	Duluth
Hanson, E. O.	Cloquet
Harlowe, H. D.	Virginia
Harris, C. N.	Hibbing
Hatch, W. E.	Duluth
Hathaway, S. J.	Proctor
Hayes, M. F.	Nashwauk
Hedberg, G. A.	Nopeming
Heiam, W. C.	Cook
Heimark, O. E.	Duluth
Hilding, A. C.	Duluth
Hill, F. E.	Duluth
Hirschboeck, F. J.	Duluth
Hirschfield, M. S.	Duluth
Hoff, H. O.	Duluth
Hursh, M. M.	Hibbing
Hutchinson, Henry	Moose Lake
Jacobson, Clarence	Chisholm
Jensen, T. J.	Duluth
Jolin, F. M.	Coleraine
Jolin, R. V.	Grand Rapids
Kemp, M. W.	Moose Lake
*Keyes, C. R.	Duluth
Kiesling, I. H.	Nashwauk
Klein, Harry	Duluth
Knapp, F. N.	Duluth
Kohlbry, C. O.	Duluth
Kotchevar, F. R.	Eveleth
Kozberg, Oscar	Moose Lake
Kraft, Peter	Duluth
Kranz, C. I.	Duluth
Kuth, J. R.	Duluth
La Bree, R. H.	Chisholm
Laird, A. T.	Nopeming
Langmack, William	Cloquet
Lenont, C. B.	Virginia
Lepak, F. J.	Duluth
Litman, S. N.	Duluth
Loofbourrow, E. H.	Keewatin
Macfarlane, P. H.	Chisholm
MacRae, G. C.	Duluth
Magney, F. H.	Duluth
Malmstrom, J. A.	Virginia
Manley, J. R.	Duluth
Marcley, W. J.	Nopeming
Martin, E. T.	Duluth
Martin, W. C.	Duluth

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*Deceased.

Mayne, R. M..........Duluth
McCarty, P. D..........Ely
McComb, C. F..........Duluth
McCoy, Mary K..........Duluth
McDaniel, S. P..........Virginia
McDonald, A. L..........Duluth
McHaffie, O. L..........Duluth
McKenna, M. J..........Grand Rapids
McLeod, J. L..........Grand Rapids
McNutt, J. R..........Duluth
Mead, C. H..........Duluth
Merriman, L. L..........Duluth
Meyer, J. O..........Grand Rapids
Miners, G. A..........Deer River
Moe, R. J..........Duluth
Moe, Thomas..........Moose Lake
Monroe, P. B..........Two Harbors
More, C. W..........Eveleth
Morsman, L. W..........Hibbing
Mueller, R. F..........Two Harbors
Mueller, Selma C..........Duluth

Neff, W. S..........Virginia
Nelson, E. H..........Chisholm
Nelson, R. L..........Duluth
Nicholson, M. A..........Duluth
Nutting, R. E..........Duluth

O'Hanlon, J. A..........Proctor
Olson, A. E..........Duluth
Olson, A. O..........Duluth

Parker, O. W..........Ely
Parker, W. H..........Chisholm
Pasek, A. W..........Cloquet
Pearsall, R. P..........Virginia
Pennie, D. F..........Duluth
Peterson, E. N..........Virginia
Peterson, J. H..........Duluth
Plowman, E. T..........Marble
Power, J. E..........Duluth
Puumala, R. H..........Cloquet
Raadquist, C. S..........Hibbing
Raihala, John..........Virginia
Raiter, F. W. S..........Cloquet
Raiter, R. F..........Cloquet
Robinson, J. M..........Duluth
Rokala, H. E..........Biwabik
Rood, D. C..........Duluth
Rosenfield, A. B..........Hibbing
Rowe, O. W..........Duluth
Rowles, E. K..........Coleraine
Rudie, P. S..........Duluth
Ryan, W. J..........Duluth
Sach-Rowitz, Alvan..........Moose Lake
Salter, R. A..........Virginia
Sarff, O. E..........Virginia
Sax, S. G..........Duluth
Scherer, C. A..........Duluth
Schroder, C. H..........Duluth
Schweiger, T. R..........Hibbing
Seashore, R. T..........Duluth
Shapiro, E. Z..........Duluth
Shastid, T. H..........Duluth
Shaw, A. W..........Virginia
Sinamark, Andrew..........Hibbing
Sisler, C. E..........Grand Rapids
Slyfield, F. F..........Duluth
Smith, C. M..........Duluth
Smith, S. J..........Eveleth
Smith, W. R..........Grand Marais
Spang, A. J..........Duluth
Spicer, F. W..........Duluth
Spurbeck, R. G..........Cloquet
Strathern, M. L..........Gilbert
Strobel, W. G..........Duluth
Stuart, A. B..........Cloquet
Sukeforth, L. A..........Duluth
Sutherland, H. N..........Ely
Swanson, P. E..........Virginia
Swenson, A. O..........Duluth
Taylor, C. W..........Duluth
Tibbetts, M. H..........Duluth
Tilderquist, D. L..........Duluth
Tuohy, E. L..........Duluth
Urberg, S. E..........Duluth
Van Valkenberg, J. D..........Floodwood
Vercellini, C. E..........Duluth

Walker, A. E..........Duluth
Wallace, M. O..........Duluth
Watson, C. G..........Soudan
Webber, E. E..........Duluth
Wellman, T. G..........Virginia
Wells, A. H..........Duluth
Wheeler, D. W..........Duluth
Wilkinson, Stella L..........Duluth
Winter, J. A..........Duluth

Young, T. O..........Duluth
Young, V. A..........Duluth
Zlatovski, M. L..........Duluth

SCOTT-CARVER COUNTY MEDICAL SOCIETY

Regular meetings, second Tuesday of the month
Annual meeting, June
Number of Members: 34

President
Crow, E. R..........Arlington
Secretary
Pearson, B. F..........Shakopee

Buck, F. H..........Shakopee
Cervenka, C. F..........New Prague
Crow, E. R..........Arlington
Dowidat, R. W..........Cologne
Eklund, E. J..........Norwood
Emmerson, W. S..........Mayer
Fischer, H. P..........Shakopee
Garthe, J. J..........Shakopee
Havel, H. W..........Jordan
Hebeisen, M. B..........Chaska
Henriksen, H. G..........Northfield
Juergens, H. M..........Belle Plaine
Klein, J. C..........Shakopee
Kortsch, F. P..........Prior Lake
Kucera, S. T..........Lonsdale
Maertz, W. F..........New Prague
Malerich, J. A..........Shakopee
Martin, T. P..........Arlington
Nagel, H. D..........Waconia
Novak, E. E..........New Prague
Olson, C. J..........Belle Plaine
Ormond, D. T..........Waconia
Pearson, B. F..........Shakopee
Phillips, W. H..........Jordan
Pogue, R. E..........Watertown
Reiter, H. W..........Shakopee
Rick, P. F. W..........St. Paul
Schimelpfenig, G. T..........Chaska
Shrader, J. S..........Jordan
Simons, B. H..........Chaska
Westerman, A. E..........Montgomery
Westerman, F. C..........Montgomery
Woodworth, L. F..........Le Center
Wunder, H. E..........Shakopee

SOUTHWESTERN MINNESOTA MEDICAL SOCIETY

Cottonwood, Jackson, Murray, Nobles, Pipestone and Rock Counties

Regular meetings, November and April
Annual meeting, November

Number of Members: 61

President
Waller, J. D..........Wilmont

Secretary
DeBoer, Hermanus..........Edgerton

Arnold, E. W..........Adrian
Basinger, H. P..........Windom
Basinger, H. R..........Mountain Lake
Beckering, Gerrit..........Edgerton
Benjamin, W. G..........Pipestone
Bofenkamp, F. W..........Luverne
Bong, J. H..........Jasper
Brown, A. H..........Pipestone
Carlson, J. V..........Westbrook
Chadbourn, A. G..........Heron Lake
Chunn, S. S..........Pipestone
Clark, H. H..........Edgerton
Cress, P. J..........Ellsworth
DeBoer, Hermanus..........Edgerton
Dolan, C. P..........Worthington
Doman, V. W..........Lakefield
Doms, H. C..........Slayton
Dudley, J. H..........Windom
Engh, Sigfred..........Jackson
Halloran, W. H..........Jackson
Halpern, D. J..........Brewster
Harrison, P. W..........Worthington
Hebbel, Robert..........Windom
Hitchings, W. S..........Lakefield
Hoyer, L. J..........Windom
Johnson, R. E..........Worthington
Kelling, L. F..........Lakefield
Kilbride, E. A..........Worthington
Kilbride, J. S..........Worthington
Larson, J. T..........Lake Wilson
Lohmann, J. G..........Jasper
*Lowe, Thomas..........Pipestone
Maitland, D. P..........Jackson
Maitland, E. T..........Jackson
McCrea, J. M..........Fulda
McElmeel, E. F..........Pipestone
McLane, Evelyn G..........Jackson
McLane, W. O..........Jackson
Mork, B. O., Jr..........Worthington
Mork, B. O., Sr..........Worthington
Nealy, D. E..........Adrian
Pankratz, P. J..........Mountain Lake
*Patterson, W. E..........Westbrook
Piper, W. A..........Mountain Lake
Rose, J. T..........Lakefield
Schade, F. L..........Worthington
Schutz, E. S..........Mountain Lake
Sether, A. F..........Ruthton
Settlage, A. F. E..........Worthington
Sherman, C. L..........Luverne
Sjostrom, L. E..........Storden
Slater, S. A..........Worthington
Sogge, L. L..........Windom
Stanley, C. R..........Worthington
Stevenson, B. M..........Fulda
Stratte, H. C..........Windom
Thorson, E. O..........Luverne
Tofte, Josephine..........Minneapolis
Waller, J. D..........Wilmont
Wells, W. B..........Jackson
Williams, C. A..........Pipestone
Williams, L. A..........Slayton
Wright, C. O..........Luverne

STEARNS-BENTON COUNTY MEDICAL SOCIETY

Regular meetings, third Thursday of the month
Annual meeting, third Thursday of December
Number of Members: 55

President
Wenner, W. T..........St. Cloud
Secretary
Libert, J. N..........St. Cloud

Adams, L. P..........St. Cloud
Barringer, P. E..........St. Cloud
Beuning, J. B..........St. Cloud
Brigham, C. F..........St. Cloud
Buscher, J. C..........St. Cloud
Clark, H. B..........St. Cloud
Deagen, J. R..........Freeport
Donaldson, C. S..........Foley
DuBois, J. F..........Sauk Center
Engstrom, G. F..........Belgrade
Evans, L. M..........Sauk Rapids
Fleming, T. N..........St. Cloud

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*Deceased.

Freeman, W. L.............St. Cloud
Friesleben, William......Sauk Rapids
Gaida, J. B.................St. Cloud
Goehrs, H. W...............St. Cloud
Haberman, Emil..............Osakis
Halenback, P. L............St. Cloud
Hemstead, Werner..........Brainerd
Hendrickson, R. R.........St. Cloud
Henry, C. J...................Milaca
Holdridge, George..............Foley
Johnson, Walfred........Sauk Center
Jones, R. N.................St. Cloud
Kern, M. J...................St. Cloud
Kettlewell, R. B..........Sauk Center

Kingsbury, E. M...........Clearwater
Kohler, D. W..............St. Joseph
Koop, H. E.............Cold Spring
Koop, S. H................Richmond
Kuhlmann, August...........Melrose
Lewis, C. B................St. Cloud
Libert, J. N................St. Cloud
Mahowald, A...................Albany
Mass, Max..............Chicago, Ill.
McDowell, J. P.............St. Cloud
Meyer, A. A..................Melrose
Myre, C. R................Paynesville
Rathbun, C. A..............St. Cloud
Richards, W. B.............St. Cloud
Rumpf, W. H...............St. Cloud

Sandven, N. O............Paynesville
Schatz, F. J..................St. Cloud
Sher, D. A...............Cold Spring
Sherwood, G. E..............Kimball
Stangl, Fred................St. Cloud
Stangl, P. E.................St. Cloud
Stewart, N. E...............St. Cloud
Sutton, C. S.................St. Cloud
Townsend, De Wayne.........Brooten
Walfred, K. A...............St. Cloud
Watson, W. J............Holdingford
Wenner, W. T...............St. Cloud
Wiechman, F. H...........Cass Lake
Zachman, A. H...............Melrose

STEELE COUNTY MEDICAL SOCIETY

Regular meetings, March, June, September, December
Annual meeting, January
Number of Members: 16

President
McEnaney, C. T............Owatonna

Secretary
Roberts, O. W.............Owatonna

Berghs, L. V...............Owatonna
Carlson, V. W.......Blooming Prairie

Dewey, D. H...............Owatonna
Ertel, E. Q..................Ellendale
Farabaugh, C. L...........Owatonna
Hartung, E. H.............Claremont
Kreuzer, T. C..............Owatonna
McEnaney, C. T...........Owatonna
McIntyre, J. A.............Owatonna
Melby, Benedik.....Blooming Prairie

Morehead, D. E............Owatonna
Nelson, E. J................Owatonna
Roberts, O. W..............Owatonna
Schaefer, J. F..............Owatonna
Senn, E. W.................Owatonna
*Smersh, J. F...............Owatonna
Stewart, A. B...............Owatonna

UPPER MISSISSIPPI MEDICAL SOCIETY

Aitkin, Beltrami, Cass, Clearwater, Crow Wing, Hubbard
Koochiching, Lake of the Woods, Morrison, Todd and Wadena Counties
Annual meeting, January
Number of Members: 91

President
Carlson, H. A........Ah-Gwah-Ching
Secretary
Badeaux, G. I...............Brainerd

Adkins, G. H..............Pine River
Badeaux, G. I...............Brainerd
Beise, R. A..................Brainerd
Borgerson, A. H...............Sebeka
Bosland, H. G..............Verndale
Bray, K. E.............Park Rapids
Campbell, R. W............Cass Lake
Cardle, G. E.................Brainerd
Carlson, C. E...................Aitkin
Carlson, H. A........Ah-Gwah-Ching
Christie, G. R...........Long Prairie
Christie, R. L...........Long Prairie
Cook, J. M....................Staples
Corrigan, T. E.........Waycross, Ga.
Davis, L. F....................Wadena
Davis, L. T....................Wadena
Davis, R. D...............Clearbrook
Davis, T. C....................Wadena
East, John..................Northome
Eiler, John...............Park Rapids
Ericson, M. G...........Long Prairie
Fait, R. V................Little Falls
Fitzsimons, W. E...........Brainerd
Frost, H. T...................Wadena
Garlock, A. V.................Bemidji
Garlock, D. H.................Bemidji
Gerber, M. P................Brainerd

Ghostley, Mary C............Puposky
Gifford, B. L............Long Prairie
Gilmore, Rowland.............Bemidji
Gorenflo, Leila.............Cass Lake
Grogan, J. S..................Wadena
Groschupf, T. P..............Bemidji
Grose, F. N..................Clarissa
Halliday, G. J...............Brainerd
Haller, William...............Bemidji
Hanover, R. D..............Littlefork
Hawkinson, J. P...............Crosby
Hawkinson, L. F.......Oakland, Calif.
Healy, R. T......................Pierz
Hesselgrave, S. S.............St. Paul
Holst, C. F................Little Falls
Holst, J. B................Little Falls
House, Z. E................Cass Lake
Houston, D. M...........Park Rapids
Hubbard, O. E...............Brainerd
Hubin, E. G.................Deerwood
Jacobson, D. J.................Bemidji
Jamieson, E. F..............Brainerd
Johnson, C. E.............Pine River
Johnson, D. L.............Little Falls
Johnson, E. W................Bemidji
Kelly, B. W....................Aitkin
Lamb, H. L................Little Falls
Larson, L. J...................Bagley
Laughlin, J. T..............Grey Eagle
Lee, H. W....................Brainerd
Leemhuis, G. H............McGregor
Lenarz, A. J...............Browerville

Lund, W. J....................Staples
Marcum, E. H................Bemidji
Mason, J. A........International Falls
McCann, D. F.................Bemidji
Mosby, M. E............Long Prairie
Mulligan, A. M..............Brainerd
Murray, R. A....................Aitkin
Nelson, N. P.................Brainerd
Osburn, B. F.......International Falls
Petraborg, H. T.................Aitkin
Pierce, C. H....................Wadena
Potek, David.......International Falls
Quanstrom, V. E............Brainerd
Ratcliffe, J. J....................Aitkin
Reichelderfer, C. F............Staples
Ringle, O. F....................Walker
Roberts, L. M.............Little Falls
Shannon, S. S..................Crosby
Simons, E. J.................Swanville
Smith, B. A.....................Crosby
Stein, R. J........................Pierz
Swedenburg, P. A...........Swanville
Thabes, J. A., Jr.............Brainerd
Thabes, J. A., Sr.............Brainerd
Vandersluis, C. W............Bemidji
Watson, A. M................Royalton
Watson, J. D.............Holdingford
Watson, P. T...............Cass Lake
Whittemore, D. D.............Bemidji
Will, W. W......................Bertha
Wilson, V. O.............Minneapolis
Withrow, M. E.....International Falls

WABASHA COUNTY MEDICAL SOCIETY

Regular meetings, March, October
Annual meeting, first Thursday after first Monday in October
Number of Members: 14

President
Bouquet, B. J................Wabasha

Secretary
Wilson, W. F...............Lake City

Bayley, E. C...............Lake City

Bouquet, B. J...............Wabasha
Cochrane, W. J.............Lake City
Collins, J. S..................Wabasha
Ellis, E. W.....................Elgin
Flesche, B. A..............Lake City
Frost, R. H....................Wabasha

Glabe, R. A.................Plainview
Holt, G. W....................Wabasha
Mahle, D. G................Plainview
Ochsner, C. G...............Wabasha
Replogle, W. H..............Wabasha
Slocumb, J. A..............Plainview
Wilson, W. F...............Lake City

WASECA COUNTY MEDICAL SOCIETY

Regular meetings, none
Annual meeting, January
Number of Members: 10

President
Chadbourn, C. R............Janesville
Secretary
Olds, G. H....................Waseca

Bernstein, W. C.........New Richland
Chadbourn, C. R............Janesville
Cummings, D. W.............Waseca
Gallagher, B. J................Waseca
Hottinger, R. C.............Janesville

McIntire, H. M...............Waseca
Oeljen, S. C. G...............Waseca
Olds, G. H.....................Waseca
Swenson, O. J.................Waseca
Wadd, C. T...................Waseca

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*Deceased.

WASHINGTON COUNTY MEDICAL SOCIETY

Regular meetings, second Tuesday in January, February, March, April, May, September, October November and December
Annual meeting second Tuesday in December
Number of Members: 17

President
McCarten, F. M.............Stillwater

Secretary
Boleyn, E. S...............Stillwater

Boleyn, E. S.	Stillwater
Brooks, G. F.	Stillwater
Ewald, R. P.	Newport
Gray, R. C.	Stillwater
Haines, J. H.	Stillwater
Humphrey, W. R.	Stillwater
Johnson, R. G.	Stillwater
Josewski, R. J.	Stillwater
Kalinoff, D.	Stillwater
McCarten, F. M.	Stillwater
Mingo, F. E.	Hugo
Poirier, J. A.	Forest Lake
Ruggles, G. McC.	Forest Lake
Samson, E. R.	Stillwater
Strand E. V.	Bayport
Street, Bernard	Stillwater
Stuhr, J. W.	Stillwater

WATONWAN COUNTY MEDICAL SOCIETY

Regular meeting, at call
Annual meeting, December
Number of Members: 8

President
Hammar, L. M.............Butterfield

Secretary
Grimes, H. B.................Madelia

Bergman, O. B.	St. James
Bratrude, E. J.	St. James
Bregel, F. L.	St. James
Grimes, H. B.	Madelia
Hagen, O. E.	Butterfield
Hammar, L. M.	Butterfield
McCarthy, W. J.	Madelia
Thompson, Albert	St. James

WEST CENTRAL MINNESOTA MEDICAL SOCIETY

Big Stone, Pope, Stevens, and Traverse Counties
Regular meetings, March, May, October, December
Annual meeting October
Number of Members: 26

President
McIver, B. A..................Lowry

Secretary
Linde, Herman.................Cyrus

Arneson, A. I.	Morris
Behmler, F. W.	Morris
Bergan, Otto	Clinton
Bolsta, Charles	Ortonville
Caine, C. E.	Morris
Cumming, J. F.	Morris
Doleman, N. F.	Tintah
Eberlin, E. A.	Glenwood
Elsey, E. McC.	Glenwood
Elsey, J. R.	Glenwood
Engdahl, F. W.	Ortonville
Ewing, C. F.	Wheaton
Fitzgerald, E. T.	Morris
Garrow, D. M.	Graceville
Giesen, A. F.	Starbuck
Karn, B. R.	Ortonville
Lindberg, A. L.	Wheaton
Linde, Herman	Cyrus
McIver, B. A.	Lowry
Mooney, L. P.	Graceville
Muir, W. F.	Graceville
O'Donnell, D. M.	Ortonville
Oliver, C. I.	Graceville
Oliver, I. L.	Graceville
Ransom, M. L.	Hancock
Shelver, H. J.	Ortonville

WINONA COUNTY MEDICAL SOCIETY

Regular meetings, first Monday in January, April, July, October
Annual meeting, first Monday in January
Number of Members: 29

President
Page, R. L................St. Charles

Secretary
Steiner, I. W.................Winona

Benoit, F. T.	Winona
Christensen, E. E.	Winona
Heise, W. F. C.	Winona
Heise, W. V.	Winona
Jacobs, L. G.	Winona
Keyes, J. D.	Winona
Lindsay, W. V.	Winona
Loomis, G. L.	Winona
Mattison, P. A.	Winona
McLaughlin, E. M.	Winona
Meinert, A. E.	Winona
Nauth, W. W.	Winona
Neumann, C. A.	Winona
Nilles, L. J.	Rollingstone
Page, R. L.	St. Charles
Risser, E. D.	Winona
Robbins, C. P.	Winona
Roemer, H. J.	Winona
Roth, F. D.	Lewiston
Satterlee, H. W.	Lewiston
Schaefer, Samuel	Winona
Steiner, I. W.	Winona
Tweedy, G. J.	Winona
Tweedy, J. A.	Winona
Tweedy, R. B.	Winona
Walker, G. H.	Winona
Whetstone, S. D.	Winona
Wilson, R. H.	Winona
Younger, L. I.	Winona

WRIGHT COUNTY MEDICAL SOCIETY

Regular meetings, quarterly
Annual meeting, first Wednesday after first Monday in October
Number of Members: 18

President
Catlin, T. J...................Buffalo

Secretary
Catlin, J. J...................Buffalo

Anderson, W. P.	Buffalo
Bendix, L. H.	Annandale
Catlin, J. J.	Buffalo
Catlin, T. J.	Buffalo
Ellison, F. E.	Monticello
Greenfield, W. T.	Delano
Grundset, O. J.	Montrose
Harriman, L.	Howard Lake
Hart, W. E.	Monticello
Lee, J. L.	Watertown
Peterson, O. L.	Cokato
Phillips, A. E.	Delano
Ridgway, A. M.	Annandale
Roholt, C. L.	Waverly
Rolig, D. H.	Howard Lake
Rousseau, Victor	Maple Lake
Thielen, R. D.	St. Michael
Thompson, Arthur	Cokato

ALPHABETIC ROSTER

Aagaard, G. N., Jr.	Minneapolis
Aanes, A. M.	Red Wing
Aanes, A. R.	Red Wing
Abbott, C. B.	Springfield
Abbott, J. S.	St. Paul
Aborn, W. H.	Hawley
Abraham, A. L.	Duluth
Abramson, Milton	Minneapolis
Adams, B. S.	Hibbing
Adams, J. M.	Minneapolis
Adams, L. P.	St. Cloud
Adams, R. C.	Bird Island
Adams, R. C.	Rochester
Addington, E. A.	Rochester
Addy, E. R.	Gilbert
Adkins, C. M.	Thief River Falls
Adkins, G. H.	Pine River
Adson, A. W.	Rochester
Affeldt, D. E.	Kasson
Ahl, C. W.	Hibbing
Ahlts, J. J.	Caledonia
Ahrens, A. E.	St. Paul
Ahrens, A. H.	St. Paul
Ahrens, R. S.	Minneapolis
Aitkens, H. B.	Le Center
Akester, Ward	Marshall
Akins, W. M.	Eveleth
Alberts, M. W.	St. Paul
Alden, J. F.	St. Paul
Alexander, F. H.	St. Paul
Alexander, H. A.	Minneapolis
Aling, C. A.	Minneapolis
Allen, A. W.	Austin
Allen, C. C.	Austin
Allen, E. V. N.	Rochester
Allen, H. W.	Minneapolis
Allen, H. B.	Austin
Allison, R. G.	Minneapolis
Altnow, H. O.	Minneapolis
Alvarez, W. C.	Rochester
Amberg, Samuel	Rochester
Andersen, A. G.	Minneapolis
Andersen, S. C.	Minneapolis
Anderson, D. D.	Minneapolis
Anderson, E. D.	Minneapolis
Anderson, E. M.	Lamberton
Anderson, E. R.	Minneapolis
Anderson, F. J.	Minneapolis
Anderson, H. R.	Deer River
Anderson, J. K.	Minneapolis
Anderson, K. W.	Minneapolis
Anderson, M. J.	Rochester
Anderson, N. E.	Harmony
Anderson, P. A.	Minneapolis
Anderson, R. E.	Willmar
Anderson, S. H.	Red Wing
Anderson, U. S.	Minneapolis
Anderson, W. E.	Thief River Falls
Anderson, W. P.	Buffalo
Anderson, W. S.	Minneapolis
Andreassen, E. C.	Minneapolis
Andrews, R. N.	Mankato
Andrews, R. S.	Minneapolis
Annis, H. B.	Minneapolis
Archer, G. F., Jr.	Atlanta, Georgia
Arends, A. L.	Sandstone
Arey, S. L.	Excelsior
Arlander, C. E.	Minneapolis
Arling, L. S.	Minneapolis
Armstrong, E. L.	Duluth
Armstrong, J. M.	St. Paul
Arndt, H. W.	Detroit Lakes
Arneson, A. I.	Morris
Arnold, Anna W.	Minneapolis
Arnold, D. C.	Minneapolis
Arnold, E. W.	Adrian
Arnold, J. E.	Mountain Iron
Arnquist, A. S.	St. Paul
Arnson, J. M.	Benson
Arvidson, C. G.	Minneapolis
Athens, A. G.	Duluth
Aune, Martin	Minneapolis
Aurand, W. H.	Minneapolis
Aurelius, J. R.	St. Paul
Ausman, C. F.	St. Paul
Autry, D. H.	Rochester
Ayres, G. T.	Ely
Babcock, F. M.	Northfield
Bachnik, F. W.	Hibbing
Bacon, D. K.	St. Paul
Bacon, L. C.	St. Paul
Bacon, R. S.	Montevideo
Badeaux, G. I.	Brainerd
Baggenstoss, A. H.	Rochester
Bagley, C. M.	Duluth
Bagley, Elizabeth C.	Duluth
Bagley, W. R.	Duluth
Bagwell, J. S., Jr.	Rochester
Bailey, A. A.	Rochester
Bailey, H. B.	Fairmont
Bair, H. L.	Rochester
Baken, M. P.	Minneapolis
Baker, A. B.	Minneapolis
Baker, A. C.	Fergus Falls
Baker, A. T.	Minneapolis
Baker, E. L.	Minneapolis
Baker, H. R.	Hayfield
Baker, Looe	Minneapolis
Baker, N. H.	Fergus Falls
Baker, R. L.	Hayfield
Baker, Theodore, Jr.	Rochester
Bakkila, H. E.	Duluth
Balcome, M. M.	St. Paul
Balfour, D. C.	Rochester
Balkin, S. G.	Minneapolis
Barber, J. P.	Minneapolis
Bardon, Richard	Duluth
Bargen, J. A.	Rochester
Barker, N. W.	Rochester
Barnes, A. R.	Rochester
Barney, L. A.	Duluth
Barr, L. C.	Albert Lea
Barr, W. H.	Wells
Barrett, E. E.	Duluth
Barringer, P. E.	St. Cloud
Barron, Moses	Minneapolis
Barry, L. W.	St. Paul
Barsness, Nellie O. N.	St. Paul
Basinger, H. P.	Windom
Basinger, H. R.	Mountain Lake
Basom, W. C.	Rochester
Bass, G. W.	Minneapolis
Baxter, S. H.	Minneapolis
Bayard, H. F.	Minneapolis
Bayley, E. C.	Lake City
Beadie, W. D.	Cannon Falls
Beals, Hugh	St. Paul
Beard, A. H.	Minneapolis
Becker, F. T.	Duluth
Beckering, Gerrit	Edgerton
Beckman, W. G.	Minneapolis
Bedard, R. E.	Kankakee, Ill.
Bedford, E. W.	Minneapolis
Beech, R. H.	St. Paul
Beede, Ethel R.	Faribault
Beek, H. O.	St. Paul
Behmler, F. W.	Morris
Behr, O. K.	Crookston
Beise, R. A.	Brainerd
Beiswanger, R. H.	Wykoff
Beizer, L. H.	Rochester
Bell, C. C.	St. Paul
Bell, E. T.	Minneapolis
Belote, G. B.	Caledonia
Belzer, M. S.	Minneapolis
Bender, J. H.	Big Fork
Bendix, L. H.	Annandale
Benedict, W. L.	Rochester
Benepe, J. L.	St. Paul
Benesh, N. G.	Minneapolis
Benham, E. W.	Mankato
Benjamin, A. E.	Minneapolis
Benjamin, E. G.	Minneapolis
Benjamin, H. G.	Minneapolis
Benjamin, W. G.	Pipestone
Benn, F. G.	Minneapolis
Bennett, R. L., Jr.	Rochester
Bennion, P. H.	St. Paul
Benoit, F. T.	Winona
Benson, K. W.	Rochester
Bentley, N. P.	St. Paul
Berdez, G. L.	Duluth
Bergan, Otto	Clinton
Berge, D. O.	Roseau
Bergen, C. T.	Blue Earth
Berger, A. G.	Minneapolis
Bergh, G. S.	Minneapolis
Bergh, L. N.	Montevideo
Berghs, L. V.	Owatonna
Bergman, O. B.	St. James
Bergquist, K. E.	Battle Lake
Berkman, D. M.	Rochester
Berkman, J. M.	Rochester
Berkwitz, N. J.	Minneapolis
Berlin, A. S.	Hallock
Berman, Reuben	Minneapolis
Bernstein, W. C.	New Richland
Berrisford, P. D.	St. Paul
Bertelson, O. L.	Crookston
Bessesen, A. N., Jr.	Minneapolis
Bessesen, W. A.	Minneapolis
Betlach, C. J.	Chicago, Ill.
Beuning, J. B.	St. Cloud
Bianco, A. J.	Duluth
Bicek, J. F.	St. Paul
Biedermann, Jacob	Thief River Falls
Bigelow, C. E.	Dodge Center
Billings, R. E.	Franklin
Binet, H. E.	Grand Rapids
Binger, H. E.	St. Paul
Binger, M. W.	Rochester
Birge, R. F.	Rochester
Birkland, O. N.	Hibbing
Birnberg, T. L.	St. Paul
Black, B. M.	Rochester
Black, J. R.	Rochester
Black, William	Mankato
Blacklock, S. S.	Hibbing
Blake, James	Hopkins
Blake, James A.	Hopkins
Blakely, C. C.	Barnum
Blakey, A. R.	Osakis
Blanchard, H. G.	Fairmont
Blaustone, H. H.	Minneapolis
Blegen, H. M.	Warren
Bloedel, T. J. G.	Thief River Falls
Blomberg, W. R.	Princeton
Blumenthal, J. S.	Minneapolis
Boardman, D. V.	Twin Valley
Bock, R. A.	St. Paul
Bockman, M. W. H.	Minneapolis
Boeckmann, Egil	St. Paul
Boehme, E. J.	Minneapolis
Bofenkamp, F. W.	Luverne
Bohl, G. W.	Ada
Bohland, E. H.	St. Paul
Boies, L. R.	Minneapolis
Bolender, H. L.	St. Paul
Boleyn, E. S.	Stillwater
Boline, C. A.	Battle Lake
Bolsta, Charles	Ortonville
Boman, P. G.	Duluth
Bong, J. H.	Jasper
Boody, G. J., Jr.	Dawson
Booth, A. E.	Minneapolis
Boothby, W. M.	Rochester
Boreen, C. A.	Minneapolis
Borg, J. F.	St. Paul
Borgerson, A. H.	Sebeka
Borgeson, E. J.	Minneapolis
Borman, C. N.	Minneapolis
Borreson, Baldwin	Thief River Falls
Bosland, H. G.	Verndale
Bossert, C. S.	Mora
Bossingham, O. N.	Lake Benton
Bottolfson, B. T.	Moorhead
Bouma, L. R.	St. Paul
Bouman, H. A. H.	Minneapolis
Bouquet, B. J.	Wabasha
Bowen, R. L.	Hibbing
Bowing, H. H.	Rochester
Boyd, L. M.	Alexander
Boyer, S. H.	Duluth
Boyer, S. H., Jr.	Duluth
Boynton, Ruth E.	Minneapolis
Boysen, Herbert	Welcome
Boysen, John E.	Pelican Rapids
Boysen, Peter	Pelican Rapids
Braasch, W. F.	Rochester
Brand, G. D.	St. Paul
Brand, W. A.	Redwood Falls
Branton, A. F.	Willmar
Branton, B. J.	Willmar
Bratrud, A. F.	Minneapolis
Bratrud, Edward	Thief River Falls
Bratrude, E. J.	St. James
Braverman, N. J.	Duluth
Bray, E. R.	St. Paul
Bray, K. E.	Park Rapids
Bray, P. N.	Duluth
Bray, R. B.	Biwabik
Bregel, F. L.	St. James
Brekke, H. J.	Minneapolis
Brey, F. W.	Wabasso
Briggs, J. F.	St. Paul
Brigham, C. F.	St. Cloud
Brigham, F. T.	Watkins
Brink, A. A.	Baudette
Brink, D. M.	Isle
Broadie, T. E.	St. Paul
Broders, A. C.	Rochester
Brodie, W. D.	St. Paul
Broker, W. S.	Wadena
Brooks, C. N.	Minneapolis

Brooks, G. F...............Stillwater
Brown, A. E...............Rochester
Brown, A. H...............Pipestone
Brown, E. D..............Paynesville
Brown, E. I.................St. Paul
Brown, H. A...............Rochester
Brown, H. O...............Rochester
Brown, J. C..................St. Paul
Brown, L. L...............Crookston
Brown, P. W...............Rochester
Brown, R. W...............Rochester
Browne, H. C., Jr...........Rochester
Brownstone, Manual........Sandstone
Brumm, H. J..............Rochester
Brunsting, L. A...........Rochester
Brusegard, J. F...........Red Wing
Brutsch, G. C...........Minneapolis
Bryant, F. L............Minneapolis
Buchstein, H. F............Rochester
Buck, F. H.................Shakopee
Buckley, R. P.................Duluth
Buie, L. A..................Rochester
Bulinski, T. J................St. Paul
Bulkley, Kenneth.........Minneapolis
Burch, E. P..................St. Paul
Burch, F. E..................St. Paul
Burchell, H. B.............Rochester
Burnap, W. L..........Fergus Falls
Burns, F. M.....................Milan
Burns, H. D..............Albert Lea
Burns, M. A.....................Milan
Burns, R. M..................St. Paul
Burton, C. G.................St. Paul
Burton, J. L......................Buhl
Buscher, J. C...............St. Cloud
Bushard, W. J............Bird Island
Busher, H. H.................St. Paul
Butler, John..............Minneapolis
Butler, J. K..................Carlton
Butt, H. R.................Rochester
Butturff, C. R...............Freeborn
Butzer, J. A.................Mankato
Buzzelle, L. K..........Minneapolis

Cabell, C. L...............Rochester
Cable, M. L.............Minneapolis
Cabot, Hugh...............Rochester
Cabot, V. S.............Minneapolis
Cady, J. B..................Rochester
Cady, L. H..............Minneapolis
Cain, C. L...................St. Paul
Caine, C. E....................Morris
Cairns, R. J..................Sanborn
Caldwell, J. P...............St. Paul
Calhoun, F. W............Albert Lea
Callahan, F. F............Pokegama
Callerstrom, G. W........Minneapolis
Cameron, D. M............Rochester
Cameron, Isabell L.......Minneapolis
Camp, J. D.................Rochester
Camp, W. E.............Minneapolis
Campbell, D. C............Rochester
Campbell, L. M..........Minneapolis
Campbell, O. J..........Minneapolis
Campbell, R. W...........Cass Lake
Campbell, S. J............Rochester
Canfield, W. W.............Houston
Cantwell, W. F....International Falls
Cardle, A. E.............Minneapolis
Cardle, G. E................Brainerd
Carey, J. B..............Minneapolis
Carlson, C. E..................Aitkin
Carlson, H. A.........Ah-Gwah-Ching
Carlson, J. V...............Westbrook
Carlson, Lawrence........Minneapolis
Carlson, L. T............Minneapolis
Carlson, V. W.......Blooming Prairie
Carman, J. E...........Detroit Lakes
Carmichael, F. A., Jr.......Rochester
Caron, R. P..............Minneapolis
Carroll, W. C.................St. Paul
Carstens, C. F................Hibbing
Catlin, J. J....................Buffalo
Catlin, T. J....................Buffalo
Cavanor, F. T............Minneapolis
Ceplecha, S. F.......Redwood Falls
Cervenka, C. F...........New Prague
Chadbourn, A. G.........Heron Lake
Chadbourn, C. R...........Janesville
Chambers, W. C...........Blue Earth
Chapman, T. L................Duluth
Chatterton, C. C.............St. Paul
Chauncey, L. R............Rochester
Chermak, F. G................Hibbing
Cherry, J. H................Rochester
Chesley, A. J..................St. Paul
Chew, E. M.......Seattle, Washington
Christensen, E. E............Winona
Christensen, E. P.......Two Harbors
Christenson, G. R.........Minneapolis
Christiansen, Andrew........St. Paul

Christianson, H. W.......Minneapolis
Christie, G. R............Long Prairie
Christie, R. L...........Long Prairie
Christison, J. T..............St. Paul
Chunn, S. S................Pipestone
Clagett, O. T................Rochester
Clark, F. F.....................Duluth
Clark, H. B..................St. Cloud
Clark, H. B., Jr...............St. Paul
Clark, H. H..................Edgerton
Clark, H. S..............Minneapolis
Clark, L. W............Spring Valley
Clark, R. L., Jr.............Rochester
Clark, T. C..............Minneapolis
Clay, L. B...............Minneapolis
Claydon, D. R..............Red Wing
Claydon, H. F..............Zumbrota
Claydon, L. E.............Red Wing
Clement, J. B..........Lester Prairie
Clement, T. G..................Duluth
Cleveland, W. H............Rochester
Clifford, G. W............Alexandria
Clifton, T. A.................Chatfield
Clothier, E. F..............Elk River
Cochrane, B. B..............Coleraine
Cochrane, W. J.............Lake City
Cohen, B. A..............Minneapolis
Cohen, S. S..............Oak Terrace
Colby, W. L...................St. Paul
Cole, H. B............Redwood Falls
Cole, J. G............Redwood Falls
Cole, W. H...................St. Paul
Collie, H. G..................St. Paul
Collins, A. N...................Duluth
Collins, H. C...................Duluth
Collins, J. S.................Wabasha
Colvin, A. R..................St. Paul
Colyer, G. E................Rochester
Combacker, L. C.........Fergus Falls
Comfort, M. W.............Rochester
Condit, W. H...........Minneapolis
Condon, W. B.............Rochester
Connor, C. E.................St. Paul
Conway, J. F...............Rochester
Cook, C. K...................St. Paul
Cook, E. N.................Rochester
Cook, H. W..............Minneapolis
Cook, J. M.....................Staples
Cooney, H. C...............Princeton
Cooper, C. C..................St. Paul
Cooper, M. D.............Winnebago
Cooperman, H. O.........Minneapolis
Corbett, J. F. ....Minneapolis
Corniea, A. D............Minneapolis
Corrigan, J. E.........Waycross, Ga.
Cosgriff, J. A....................Olivia
Cottam, G. G............Minneapolis
Counseller, V. S.............Rochester
Countryman, R. S...........St. Paul
Covell, W. W.................St. Peter
Coventry, W. A................Duluth
Coventry, W. D................Duluth
Cowan, G. M.................Brimson
Cowern, E. W.........North St. Paul
Cragg, R. W...............Rochester
Craig, W. McK.............Rochester
Cranmer, R. R...........Minneapolis
Cranston, R. W..........Minneapolis
Creevy, C. D............Minneapolis
Creighton, R. H.........Minneapolis
Crenshaw, J. L............Rochester
Cress, E. E.......................Boyd
Cress, P. J...................Ellsworth
Crewe, J. E.................Rochester
Critchfield, L. R..............St. Paul
Cronin, T. D................Rochester
Cronwell, B. J...................Austin
Crow, E. R..................Arlington
Crumpacker, L. K..........Rochester
Culligan, J. M................St. Paul
Cumming, J. F.................Morris
Cummings, D. W.............Waseca
Curtin, J. F...............Minneapolis
Curtis, R. A................Le Center
Cusick, P. L.................Rochester
Cutler, H. H................Rochester
Cutts, George............Minneapolis
Cutts, R. E..............Minneapolis

Dack, L. G....................St. Paul
Dady, E. E...............Minneapolis
Dahl, E. O...............Minneapolis
Dahl, G. A....................Mankato
Dahl, J. A...............Minneapolis
Dahlin, I. T.....................Aurora
Daignault, Oscar..............Benson
Daniel, D. H.............Minneapolis
Daniel, L. M.............Minneapolis
Danielson, K. A..............Litchfield

Danielson, Lennox..........Litchfield
Darling, J. P...............Rochester
Dart, L. O...............Minneapolis
Daugherty, E. B...Marine-on-St. Croix
Daugherty, L. E.............St. Paul
Davies, R. J................Nopeming
Davis, A. C.................Rochester
Davis, B. F.....................Duluth
Davis, Herbert..............St. Paul
Davis, I. G..................Rushford
Davis, J. C..............Minneapolis
Davis, L. F....................Wadena
Davis, L. T....................Wadena
Davis, R. D...............Clearbrook
Davis, T. C....................Wadena
Davis, William..............St. Paul
Day, Lois A................Rochester
Deagen, J. R..................Freeport
Dearing, W. H., Jr.........Rochester
De Boer, Hermanus........Edgerton
Dedolph, Karl.................St. Paul
Dedolph, T. H.................Braham
Delavan, P. A................St. Paul
Delmonico, E. J............Rochester
Delmore, J. L., Jr............Roseau
Delmore, J. L..................Roseau
del Plaine, C. W........Minneapolis
Demo, P. W......................Wells
Derauf, B. I...................St. Paul
Derbyshire, R. C...........Rochester
Desjardins, A. U...........Rochester
Devereaux, T. J.........Minneapolis
Dewey, D. H................Owatonna
Dickson, D. D.............Rochester
Dickson, T. H...............St. Paul
Diehl, H. S..............Minneapolis
Diessner, H. D..........Minneapolis
Dittman, G. C................St. Paul
Dix, C. R....................Rochester
Dixon, C. F................Rochester
Dockerty, M. B...........Rochester
Doehring, P. C., Jr.......Rochester
Doering, R. E...........Minneapolis
Dolan, C. P..............Worthington
Dolder, F. C......................Eyota
Doleman, N. F..................Tintah
Doman, V. W...............Lakefield
Doms, H. C. A...............Slayton
Donaldson, C. S..................Foley
Donath, D. H..............Rochester
Donohue, P. F...............St. Paul
Donovan, D. L...........Albert Lea
Doolittle, L. E..................Duluth
Dordal, John............Sacred Heart
Dorge, R. I..............Minneapolis
Dornblaser, H. B.........Minneapolis
Dorsey, G. C............Minneapolis
Doss, A. K.................Rochester
Dovre, C. M..................St. Paul
Dowidat, R. W...............Cologne
Dowswell, W. J...........Kerkhoven
Doxey, G. L.............Minneapolis
Doyle, G. C.....................Duluth
Doyle, L. O..............Minneapolis
Drake, C. B...................St. Paul
Drake, C. R..............Minneapolis
Dredge, H. P..............Sandstone
Drill, H. E....................Hopkins
Dripps, Della G............Rochester
Drought, W. W..........Fergus Falls
Dry, T. J....................Rochester
Dubbe, F. H................New Ulm
Dublin, William............Rochester
Du Bois, J. F............Sauk Centre
Dudley, J. H...................Windom
Duff, E. R...............Minneapolis
Dugan, L. F.................Faribault
Dukelow, D. A...........Minneapolis
Dumas, A. G............Minneapolis
Duncan, J. W..............Moorhead
Dungay, N. S..............Northfield
Dunlap, E. H...........Minneapolis
Dunn, G. R..............Minneapolis
Dunn, J. N....................St. Paul
Duryea, W. M............Minneapolis
Dutton, C. E............Minneapolis
Dvorak, B. A............Minneapolis
Dwan, P. F..............Minneapolis
Dworsky, S. D...........Minneapolis
Dysterheft, A. F.............Gaylord

Earl, G. A.....................St. Paul
Earl, J. R......................St. Paul
Earl, Robert...................St. Paul
East, John...................Northome
Eaton, L. M................Rochester
Eberlin, E. A...............Glenwood
Ecker, A. D.................Rochester
Eckhardt, C. L..........Minneapolis
Eckman, P. F..................Duluth
Eckman, R. J...................Duluth

Ederer, J. J.	Mahnomen
Edlund, Gustaf	St. Paul
Edwards, J. W.	St. Paul
Edwards, R. T.	Elysian
Edwards, T. J.	St. Paul
Ehrenberg, C. J.	Minneapolis
Ehrlich, S. P.	Minneapolis
Eich, M. A.	Minneapolis
Eiler, John	Park Rapids
Eisenstadt, D. H.	Minneapolis
Eitel, G. D.	Minneapolis
Ekblad, J. W.	Duluth
Eklund, E. J.	Norwood
Elias, F. J.	Duluth
Elkins, E. C.	Rochester
Ellingson, A. R.	Detroit Lakes
Elliott, W. S.	Virginia
Ellis, E. W.	Elgin
Ellison, D. E.	Minneapolis
Ellison, F. E.	Monticello
Elsey, E. M.	Glenwood
Elsey, J. R.	Glenwood
Ely, O. S.	So. St. Paul
Emanuel, K. W.	Duluth
Emerson, E. C.	St. Paul
Emmerson, W. S.	Mayer
Emmett, J. L.	Rochester
Endress, E. K.	St. Paul
Engberg, E. J.	Faribault
Engdahl, F. W.	Ortonville
Englehart, P. C.	Minneapolis
Engh, Sigfred	Jackson
Engle, D. E.	Rochester
Engstrand, O. J.	Minneapolis
Engstrom, G. F.	Belgrade
Eppard, R. M.	Cloquet
Erdmann, C. A.	Minneapolis
Erich, J. B.	Rochester
Erickson, A. O.	Ivanhoe
Erickson, C. O.	Rochester
Erickson, Eskil	Halstad
Erickson, R. E.	Hector
Erickson, R. F.	Minneapolis
Ericson, R. M.	Minneapolis
Ericson, Swan,	Le Sueur
Ericsson, M. G.	Long Prairie
Ernest, G. C. H.	So. St. Paul
Ertel, E. Q.	Ellendale
Eshelby, E. C.	St. Paul
Esser, John	Perham
Esser, O. J.	Gibbon
Estrem, C. O.	Fergus Falls
Estrem, T. A.	Hibbing
Eusterman, G. B.	Rochester
Evans, E. T.	Minneapolis
Evans, L. M.	Sauk Rapids
Evans, R. D.	Minneapolis
Evarts, A. B.	Rochester
Ewald, R. P.	Newport
Ewens, H. B.	Virginia
Ewing, C. F.	Wheaton

Faber, J. E.	Rochester
Fahey, E. W.	St. Paul
Fahr, G. E.	Minneapolis
Fairchild, R. D.	Rochester
Fait, R. V.	Little Falls
Fankboner, A. V.	Buhl
Fansler, W. A.	Minneapolis
Farabaugh, C. L.	Owatonna
Farrish, R. C.	Sherburn
Fawcett, A. M.	Renville
Fawcett, C. E.	Stewartville
Fawcett, K. R.	Duluth
Feeney, J. M.	Minneapolis
Feldman, F. M.	Rochester
Fellows, M. F.	Duluth
Fenger, E. P. K.	Oak Terrace
Ferguson, J. C.	St. Paul
Ferris, D. O.	Rochester
Fesenmaier, O. B.	New Ulm
Fesler, H. H.	St. Paul
Fetterly, Warren	Minneapolis
Feuling, J. C.	Bovey
Figi, F. A.	Rochester
Fine, B. A.	Winsted
Fink, L. W.	Minneapolis
Fink, W. H.	Minneapolis
Fischer, H. P.	Shakopee
Fischer, M. McC.	Duluth
Fisher, H. C.	Rochester
Fisher, I. I.	Ceylon
Fisher, J. M.	Fergus Falls
Fisketti, Henry	Duluth
Fitzgerald, D. F.	Minneapolis
Fitzgerald, E. T.	Morris
Fitzsimmons, W. E.	Brainerd
Fjeldstad, C. A.	Minneapolis
Flanagan, H. F.	St. Paul
Flanagan, L. G.	Austin
Flancher, L. H.	Lake Park
Fleming, A. S.	Minneapolis
Fleming, T. N.	St. Cloud
Flesche, B. A.	Lake City
Flinn, T. E.	Redwood Falls
Flom, M. G.	Zumbrota
Fogarty, C. W.	St. Paul
Fogelberg, E. J.	St. Paul
Foley, F. E. B.	St. Paul
Foley, M. P.	Los Angeles, Calif.
Folken, F. G.	Albert Lea
Forbes, R. S.	Duluth
Ford, B. C.	Marshall
Ford, W. H.	Minneapolis
Foshager, H. T.	Clara City
Foster, W. K.	Minneapolis
Fowler, L. H.	Minneapolis
Franchere, F. W.	Lake Crystal
Francis, D. W.	Morristown
Frank, J. E.	Marshall
Fredericks, G. M.	Minneapolis
Frederickson, Alice C.	Willmar
Frederickson, G. U. Y.	Willmar
Freeman, C. D.	St. Paul
Freeman, G. H.	St. Peter
Freeman, J. P.	Albert Lea
Freeman, W. L.	St. Cloud
Friedman, L. L.	St. Paul
Freligh, W. P.	Albert Lea
Fricke, R. E.	Rochester
Friedell, Aaron	Minneapolis
Friedell, M. T.	Rochester
Friesleben, William	Sauk Rapids
Frisch, F. P.	Willmar
Fritsche, Albert	New Ulm
Fritsche, C. J.	New Ulm
Fritsche, T. R.	New Ulm
Fritz, W. L.	St. Paul
Fritzell, K. E.	Minneapolis
Froats, C. W.	St. Paul
Frost, E. H.	Willmar
Frost, H. T.	Wadena
Frost, R. H.	Wabasha
Fugina, G. R.	Mankato
Fuller, Alice H.	Minneapolis
Funk, V. K.	Oak Terrace

Gaarde, F. W.	Rochester
Gager, E. C.	St. Paul
Gaida, J. B.	St. Cloud
Gaines, E. C.	Buffalo Lake
Gallagher, B. J.	Waseca
Gamble, J. W.	Albert Lea
Gamble, P. M.	Albert Lea
Gammell, J. H.	Minneapolis
Garbrecht, A. W.	St. Paul
Gardiner, D. G.	St. Paul
Gardner, E. L.	Minneapolis
Gardner, J. W.	Rochester
Gardner, V. H.	Fairmont
Gardner, W. P.	Anoka
Garlock, A. V.	Bemidji
Garlock, D. H.	Bemidji
Garrow, D. M.	Graceville
Garthe, J. J.	Shakopee
Geer, E. K.	St. Paul
Gehlen, J. N.	St. Paul
Gendron, J. F. X.	Grand Rapids
Gerber, M. P.	Brainerd
Germo, Charles	Balaton
Ghent, C. H.	St. Paul
Ghormley, R. K.	Rochester
Ghostley, Mary C.	Puposky
Gibbons, F. C.	Comfrey
Gibbs, E. C.	St. Paul
Giere, E. O.	Minneapolis
Giere, J. C.	Minneapolis
Giere, R. W.	Minneapolis
Giere, S. W.	Benson
Giesen, A. F.	Starbuck
Giessler, P. W.	Minneapolis
Giffin, H. M.	Rochester
Giffin, H. Z.	Rochester
Giffin, L. A.	Rochester
Gifford, B. L.	Long Prairie
Gilbert, M. G.	Minneapolis
Gilfillan, J. S.	St. Paul
Gilkey, S. E.	St. Paul
Gilles, F. L.	Minneapolis
Gillespie, M. G.	Duluth
Gillespie, N. H.	Duluth
Gilmore, Rowland	Bemidji
Ginsberg, William	St. Paul
Giroux, A. A.	Moose Lake
Girvin, R. B.	Minneapolis
Glabe, R. A.	Plainview
Goblirsch, A. P.	Sleepy Eye
Goehrs, H. W.	St. Cloud
Golberg, M. L.	Minneapolis
Goldberg, I. M.	Minneapolis
Goldish, D. R.	Duluth
Goldman, T. I.	Minneapolis
Goltz, E. V.	St. Paul
Good, C. A., Jr.	Rochester
Good, H. D.	Minneapolis
Goodman, C. E.	Virginia
Goodson, W. H., Jr.	Rochester
Gordon, P. E.	Minneapolis
Gore, H. R.	Rochester
Gorenflo, Leila A.	Cass Lake
Gosslee, G. L.	Moorhead
Gowan, L. R.	Duluth
Graham, Robert	Duluth
Graham, R. W.	Rochester
Grant, H. W.	St. Paul
Gratzek, Thomas	St. Paul
Grau, R. K.	St. Paul
Grave, Floyd	Minneapolis
Graves, R. B.	Red Wing
Graves, W. N.	Duluth
Gray, F. D.	Marshall
Gray, H. K.	Rochester
Gray, R. C.	Stillwater
Greenberg, H. A.	St. Paul
Greene, L. F.	Rochester
Greenfield, W. T.	Delano
Gregg, R. O.	Rochester
Griffin, P. J.	Fertile
Grimes, B. P.	St. Peter
Grimes, H. B.	Madelia
Grimes, Marian	Minneapolis
Grindlay, J. H.	Rochester
Grise, W. B.	Austin
Griswold, F. E.	Hoffman
Groff, J. E.	Rochester
Grogan, J. S.	Wadena
Gronvall, P. R.	Minneapolis
Groschupf, T. P. E.	Bemidji
Grose, F. N.	Clarissa
Gruenhagen, A. P.	St. Paul
Grundset, O. J.	Montrose
Guernsey, C. M.	Rochester
Gullixson, Andrew	Albert Lea
Gully, R. J.	St. Peter
Gunderson, N. A.	Minneapolis
Gunderson, R. M.	Lake Park
Gunlaugson, F. G.	Mankato
Gushurst, E. G.	Minneapolis
Gustason, H. T.	Minneapolis

Habein, H. C.	Rochester
Haberman, Emil	Osakis
Hacking, F. H.	Minneapolis
Haessly, S. B.	Faribualt
Hagaman, G. K.	St. Paul
Hagen, O. E.	Butterfield
Hagen, O. J.	Moorhead
Haggard, G. D.	Minneapolis
Haight, G. G.	Audubon
Haines, J. H.	Stillwater
Haines, S. F.	Rochester
Halenbeck, P. L.	St. Cloud
Hall, A. R.	St. Paul
Hall, B. E.	Rochester
Hall, H. H.	St. Paul
Hall, J. M.	Minneapolis
Halladay, G. J.	Brainerd
Hallberg, C. A.	Minneapolis
Hallenbeck, D. F.	Rochester
Haller, W. M.	Bemidji
Halloran, W. H.	Jackson
Halpern, D. J.	Brewster
Halpin, J. E.	Rush City
Hamel, A. L.	Minneapolis
Hamilton, A. S.	Minneapolis
Hamlin, G. B.	Minneapolis
Hammar, L. M.	Butterfield
Hammer, H. J.	Rochester
Hammermeister, T. F.	New Ulm
Hammerstad, L. M.	Minneapolis
Hammes, E. M.	St. Paul
Hammond, A. T. H.	Minneapolis
Hammond, J. F.	St. Paul
Hand, W. R.	Elbow Lake
Haney, C. L.	Duluth
Hankerson, R. G.	Minnesota Lake
Hannah, H. B.	Minneapolis
Hanover, R. D.	Littlefork
Hansen, C. O.	Minneapolis
Hansen, E. W.	Minneapolis
Hansen, Olga S.	Minneapolis
Hanson, A. M.	Faribault
Hanson, E. C.	Austin
Hanson, E. O.	Cloquet
Hanson, E. C.	New York Mills
Hanson, H. B.	St. Paul
Hanson, H. J.	Minneapolis
Hanson, H. V.	Minneapolis
Hanson, M. B.	Minneapolis
Hanson, W. A. H.	Minneapolis

Happe, L. J..............Minneapolis
Hargis, W. H., Jr...........Rochester
Hargraves, M. M...........Rochester
Harlow, H. D. ....Virginia
Harmon, G. E...............St. Paul
Harriman, Leonard.....Howard Lake
Harrington, C. D..........Minneapolis
Harrington, F. E.........Minneapolis
Harrington, S. W...........Rochester
Harris, C. N..................Hibbing
Harrison, M. W.............Rochester
Harrison, P. W..........Worthington
Hart, V. L.................Minneapolis
Hart, W. E..................Monticello
Hartfiel, W. F................St. Paul
Hartley, E. C.................St. Paul
Hartman, H. R.............Rochester
Hartmann, C. M..............Fairfax
Hartnagel, G. F............Red Wing
Hartung, E. H.............Claremont
Hartzell, T. B............Minneapolis
Haskell, A. D..............Alexandria
Hassett, M. F.................St. Paul
Hassett, R. G................Mankato
Hastings, D. R............Minneapolis
Hatch, W. E....................Duluth
Hathaway, S. J................Proctor
Hauge, M. I...............Clarkfield
Hauge, M. M................Clarkfield
Haugseth, Enoch.........Twin Valley
Hauser, V. P..................St. Paul
Havel, H. W....................Jordan
Havel, T. E..............Blue Earth
Haven, W. K..............Minneapolis
Havens, F. Z.................Rochester
Havens, J. G. W..............Austin
Haverfield, Addie R.......Minneapolis
Hawkins, V. J.................St. Paul
Hawkinson, J. P.................Crosby
Hawkinson, L. F......Oakland, Calif.
Hawkinson, R. P..........Minneapolis
Hawn, H. W.................Rochester
Hayden, R. O...............Rochester
Hayes, J. M...............Minneapolis
Hayes, M. F...............Nashwauk
Haynes, A. L.................Faribault
Hays, A. T..................Minneapolis
Head, D. P.................Minneapolis
Head, G. D................Minneapolis
Healy, R. T........................Pierz
Heath, A. C.................Stillwater
Hebbel, Robert...............Windom
Hebeisen, M. B..................Chaska
Heck, F. J...................Rochester
Heck, W. W....................St. Paul
Hedback, A. E............Minneapolis
Hedberg, G. A..............Nopeming
Hedemark, H. H...Thief River Falls
Hedenstrom, F. G............St. Paul
Hedenstrom, L. H.........Cambridge
Hedin, R. F............Chicago, Ill.
Hedlund, C. J..................Atwater
Hegge, O. H......................Austin
Hegge, R. S.......................Austin
Heiam, W. C........................Cook
Heiberg, E. A...........Fergus Falls
Heilman, Dorothy M. H.....Rochester
Heilman, F. R..............Rochester
Heim, R. R................Minneapolis
Heimark, J. J..................Fairmont
Heimark, K. O. E...........Duluth
Heise, W. F. C...............Winona
Heise, W. V..................Winona
Helferty, J. K......................Tracy
Helland, G. M...........Spring Grove
Helland, J. W...........Spring Grove
Helm, Standiford............Rochester
Helmholz, H. F.............Rochester
Helseth, H. K.....Thief River Falls
Hempstead, B. E...........Rochester
Hemstead, Werner............Brainerd
Hench, P. S.................Rochester
Henderson, A. J. G...........Kiester
Henderson, J. W............Rochester
Henderson, M. S............Rochester
Hendricks, Esten.........Minneapolis
Hendrickson, J. F........Minneapolis
Hendrickson, R. R.........St. Cloud
Hengstler, W. H..............St. Paul
Henney, W. H.............McIntosh
Henriksen, H. G...........Northfield
Henrikson, E. C..........Minneapolis
Henry, C. E...............Minneapolis
Henry, C. J......................Milaca
Henry, M. O..............Minneapolis
Hensel, C. N...................St. Paul
Henslin, A. E...................Le Roy
Herbert, W. L..........Granite Falls
Herbolsheimer, A. J.......Minneapolis
Herbst, R. F. ....Minneapolis
Herman, A. L............Minneapolis
Herman, Samuel..............St. Paul
Hermanson, P. E...........Hendricks
Heron, R. C....................St. Paul
Herrell, W. E................Rochester
Herrmann, E. T.............St. Paul
Hertel, G. E......................Austin
Hertz, C. S...................Rochester
Hesselgrave, S. S............St. Paul
Hewitt, Edith S.............Rochester
Hewitt, R. M.................Rochester
Heyerdale, O. C.............Rochester
Heyerdale, W. W...........Rochester
Hiebert, J. P...............Minneapolis
Higgins, J. H...............Minneapolis
Hildebrand, Alice G.........Rochester
Hilding, A. C....................Duluth
Hilger, A. W..................St. Paul
Hilger, D. D...................St. Paul
Hilger, L. A...................St. Paul
Hill, Eleanor J...........Minneapolis
Hill, F. E........................Duluth
Hilleboe, H. E................St. Paul
Hines, E. A., Jr............Rochester
Hiniker, L. P..................St. Paul
Hiniker, P. J.................Le Sueur
Hinshaw, H. C.............Rochester
Hirschboeck, F. J.............Duluth
Hirschfelder, A. D........Minneapolis
Hirschfield, M. S..............Duluth
Hirshfield, F. R...........Minneapolis
Hitchings, W. S.............Lakefield
Hoaglund, A. W..........Minneapolis
Hobbs, C. A..............Minneapolis
Hochfilzer, J. J..............St. Paul
Hodapp, R. J..................Willmar
Hodge, S. V...............Minneapolis
Hodgson, C. H.............Rochester
Hodgson, H. H.............Crookston
Hoff, Alfred ....St. Paul
Hoff, H. O.......................Duluth
Hoffert, H. E..............Minneapolis
Hoffman, M. H...............St. Paul
Hoffman, H. O. E.........Rochester
Hoffman, R. A...........Minneapolis
Hoidale, A. D....................Tracy
Holbrook, J. S...............Mankato
Holcomb, J. T.................St. Paul
Holcomb, O. W...............St. Paul
Holdridge, G. A...................Foley
Holl, P. M...............Minneapolis
Hollands, W. H...................Fisher
Hollister, C. B. H...........Rochester
Holm, H. H....................Glencoe
Holm, P. F. ....Wells
Holman, J. C................Rochester
Holmberg, C. J...........Minneapolis
Holmberg, L. J....................Canby
Holmen, R. W.................St. Paul
Holmes, A. E..............Rush City
Holmstrom, C. H.............Warren
Holst, C. F................Little Falls
Holst, J. B................Little Falls
Holt, G. W....................Wabasha
Holt, J. E.......................St. Paul
Holt, W. B. ....Minneapolis
Holtan, Theodore...........Waterville
Holzapfel, F. C...........Minneapolis
Hopkins, G. W.................St. Paul
Horton, B. T.................Rochester
Hottinger, R. C.............Janesville
Houkom, Bjarne..........Minneapolis
House, Z. E................Cass Lake
Houston, D. M...........Park Rapids
Hovde, Rolf...................Winthrop
Hovland, M. L............Minneapolis
Howard, M. A..................St. Paul
Howard, M. I..................Mankato
Howard, W. S..................St. Paul
Howell, L. P................Rochester
Hover, L. J......................Windom
Hubbard, O. E..................Brainerd
Hubin, E. G.................Deerwood
Hudec, E. R...........................Echo
Huenekens, F. J..........Minneapolis
Hullsiek, R. B..................St. Paul
Hultkrans, T. C...........Minneapolis
Hultkrans, R. E...........Minneapolis
Humphrey, E. W...........Moorhead
Humphrey, W. R...........Stillwater
Hunt, A. B....................Rochester
Hunt, R. C....................Fairmont
Hunte, A. F...............Bylas, Ariz.
Hurd, Annah...............Minneapolis
Hursh, M. M....................Hibbing
Hutchinson, C. J..........Minneapolis
Hutchinson, Henry.......Moose Lake
Huxley, F. R.................Faribault
Hymes, Charles...........Minneapolis
Hynes, J. E................Minneapolis
Ide, A. W........................St. Paul
Ikeda, Kano.....................St. Paul
Ingebrigtson, E. K. G......Moorhead
Ingerson, C. A.................St. Paul
Irvine, H. G...............Minneapolis

Jackman, R. J..............Rochester
Jackson, C. M............Minneapolis
Jacobs, A. C....................Elmore
Jacobs, D. L..................Willmar
Jacobs, G. C.............Fergus Falls
Jacobs, J. C...................Willmar
Jacobs, L. G...................Winona
Jacobson, Clarence..........Chisholm
Jacobson, D. J.................Bemidji
Jacquot, G. L..................Marshall
Jamieson, E. F.................Brainerd
Jennings, Mary H........Minneapolis
Jenovese, J. F...............Rochester
Jensen, A. H...............Hutchinson
Jensen, A. M................Brownton
Jensen, H. C..............Minneapolis
Jensen, H. H..............Minneapolis
Jensen, M. J...............Minneapolis
Jensen, R. M................Rochester
Jensen, T. J......................Duluth
Jerome, Bourne......Philadelphia, Pa.
Jesion, J. W....................St. Paul
Johanson, W. G................St. Paul
Johnson, A. B............Minneapolis
Johnson, A. E...............Red Wing
Johnson, A. E............Minneapolis
Johnson, A. M..................St. Paul
Johnson, C. E.............Pine River
Johnson, C. M...............Dawson
Johnson, D. L.............Little Falls
Johnson, D. W...............Fairmont
Johnson, E. W.................Bemidji
Johnson, E. W............Minneapolis
Johnson, H. C.........North Mankato
Johnson, H. C.......Thief River Falls
Johnson, Hans...............Kerkhoven
Johnson, H. A............Minneapolis
Johnson, H. P................Fairmont
Johnson, H. P...............Harmony
Johnson, J. A...................St. Paul
Johnson, J. A.............Minneapolis
Johnson, Julius...........Minneapolis
Johnson, N. A............Minneapolis
Johnson, N. P............Minneapolis
Johnson, N. T............Minneapolis
Johnson, O. H.........Redwood Falls
Johnson, O. J.......................Lyle
Johnson, O. V..........Fergus Falls
Johnson, P. C......................Tyler
Johnson, R. A............Minneapolis
Johnson, R. B...............Lanesboro
Johnson, R. E............Minneapolis
Johnson, R. E..........Worthington
Johnson, R. G...............Stillwater
Johnson, S. M............Minneapolis
Johnson, T. H...San Francisco, Calif.
Johnson, Walfred.........Sauk Centre
Johnson, W. E..................Morgan
Johnson, Y. T............Minneapolis
Jolin, F. M....................Coleraine
Jolin, R. V..............Grand Rapids
Jones, A. W...................Red Wing
Jones, E. M......................St. Paul
Jones, G. M...............Minneapolis
Jones, H. W...............Minneapolis
Jones, R. N....................St. Cloud
Jones, W. R...............Minneapolis
Jordan, L. S............Granite Falls
Josewich, Alexander.......Minneapolis
Josewski, R. J...............Stillwater
Joyce, G. L..................Rochester
Judd, E. S., Jr...............Rochester
Juergens, H. M..........Belle Plaine
Juers, E. H...................Red Wing
Juliar, R. O......................St. Clair
Jump, W. C.......................Kasson

Kaasa, L. J................Albert Lea
Kalin, O. T...............Minneapolis
Kalinoff, Demeter...........Stillwater
Kamman, G. R.................St. Paul
Kamp, B. A................Albert Lea
Kannary, E. L...................St. Paul
Kanne, C. W..................Faribault
Kaplan, D. H....................St. Paul
Karlstrom, A. E..........Minneapolis
Karn, B. R....................Ortonville
Kasper, E. M....................St. Paul
Kath, R. H....................Woodlake
Katzberg, L. W.........Fergus Falls
Kaufman, E. J...................Anoka
Kaufman, W. C................Appleton
Kearney, R. W...............Rochester
Keating, F. R., Jr............Rochester

Keefe, R. E.	St. Paul
Keith, N. M.	Rochester
Kelby, G. M.	Minneapolis
Kelling, L. F.	Lakefield
Kelly, B. W.	Aitkin
Kelly, J. V.	St. Paul
Kelly, P. H.	St. Paul
Kelsey, C. G.	Hinckley
Kemp, A. F.	Mankato
Kemp, M. W.	Moose Lake
Kenefick, E. V.	St. Paul
Kennedy, C. C.	Minneapolis
Kennedy, Jane F.	Minneapolis
Kennedy, R. L. J.	Rochester
Kennedy, W. A.	St. Paul
Kepler, E. J.	Rochester
Kerkhof, A. C.	Minneapolis
Kermott, L. H., Jr.	Rochester
Kern, M. J.	St. Cloud
Kernohan, J. W.	Rochester
Kerschbaumer, Luisa	St. Peter
Kershner, C. M.	Rochester
Kertesz, Geza	Minneapolis
Kesting, Herman	St. Paul
Kettlewell, R. B.	Sauk Centre
Keyes, J. D.	Winona
Kibbe, O. A.	Minneapolis
Kibler, F. E.	Austin
Kierland, P. E.	Alexandria
Kierland, R. R.	Rochester
Kiesling, I. H.	Nashwauk
Kilbride, E. A.	Worthington
Kilbride, J. S.	Worthington
Killins, J. A.	Rochester
Kindschi, L. G.	Rochester
King, E. A.	Minneapolis
King, G. L.	St. Paul
King, H. T.	Minneapolis
King, W. L. M.	Rochester
Kingsbury, E. M.	Clearwater
Kinsella, T. J.	Minneapolis
Kirk, G. P.	East Grand Forks
Kirklin, B. R.	Rochester
Kirklin, O. L.	Rochester
Kistler, A. J.	Minneapolis
Kistler, C. M.	Minneapolis
Klein, Harry	Duluth
Klein, H. N.	St. Paul
Klein, J. C.	Shakopee
Klima, W. W.	Stewart
Knapp, F. N.	Duluth
Knapp, M. E.	Minneapolis
Knauff, M. K.	St. Paul
Knight, R. R.	Minneapolis
Knight, R. T.	Minneapolis
Knutson, G. A.	Greenbush
Koch, Eleanor A. S.	Rochester
Koch, F. L. P.	New York, N. Y.
Koelsche, G. A.	Rochester
Koepcke, G. M.	Minneapolis
Koepsell, A. A. H.	St. Paul
Kohlbry, C. O.	Duluth
Kohler, D. W.	St. Joseph
Kolars, J. J.	Le Center
Koller, H. M.	Minneapolis
Koller, L. R.	Minneapolis
Koop, H. E.	Cold Spring
Koop, S. H.	Richmond
Korchik, J. P.	Minneapolis
Kortsch, F. P.	Prior Lake
Kostick, W. R.	Fertile
Kotchevar, F. R.	Eveleth
Kowallis, G. F.	Rochester
Kozberg, Oscar	Moose Lake
Kraft, Peter	Duluth
Krantz, C. I.	Duluth
Krause, C. W.	Fairmont
Kreuzer, T. C.	Owatonna
Krusen, F. H.	Rochester
Kucera, F. J.	Hopkins
Kucera, S. T.	Lonsdale
Kucera, W. J.	Minneapolis
Kugler, A. A.	St. Paul
Kuhlmann, August	Melrose
Kusske, A. L.	New Ulm
Kuth, J. R.	Duluth
Kvale, W. F.	Rochester
Kvitrud, Gilbert	St. Paul

La Bree, R. H.	Chisholm
Laird, A. T.	Nopeming
Lajoie, J. M.	Minneapolis
Lamb, H. L.	Little Falls
Lander, H. H.	Rochester
Lang, L. A.	Minneapolis
Langenderfer, F. V.	St. Paul
Langhoff, A. H.	Glencoe
Langmack, W. A.	Cloquet
Lannin, J. C.	Mabel
Lapierre, A. P.	Minneapolis
Lapierre, C. A.	Minneapolis
Lapierre, J. T.	Minneapolis
Larsen, C. L.	St. Paul
Larsen, F. W.	Minneapolis
Larsen, O. O.	Detroit Lakes
Larson, Arnold	Detroit Lakes
Larson, C. M.	Minneapolis
Larson, J. T.	Lake Wilson
Larson, L. J.	Bagley
Larson, L. M.	Minneapolis
Larson, L. M.	Oak Terrace
Larson, P. N.	Minneapolis
Laughlin, J. T.	Grey Eagle
La Vake, R. T.	Minneapolis
Lax, M. H.	St. Paul
Laymon, C. W.	Minneapolis
Lazar, H. L.	Minneapolis
Leahy, Bartholomew	St. Paul
Leavenworth, R. O.	St. Paul
Leavitt, H. H.	Minneapolis
Lebowske, J. A.	Minneapolis
Leck, P. C.	Austin
Le Clercq, G. T. A.	Minneapolis
Leddy, E. T.	Rochester
Lee, H. M.	Minneapolis
Lee, H. W.	Brainerd
Lee, J. L.	Watertown
Lee, W. A.	Fergus Falls
Lee, W. N.	Madison
Leffel, J. M., Jr.	Rochester
Leemhuis, G. H.	McGregor
Leibold, H. H.	Parkers Prairie
Leick, R. M.	St. Paul
Leitch, Archibald	St. Paul
Leitch, N. M.	Warroad
Leland, H. R.	Minneapolis
Leland, J. T.	Herman
Lemon, W. S.	Rochester
Lenander, M. E.	St. Peter
Lenarz, A. J.	Browerville
Lende, Norman	Faribault
Lenont, C. B.	Virginia
Lenz, J. R.	Morton
Lenz, O. A.	Minneapolis
Leonard, L. J.	Minneapolis
Leonard, Samuel	Minneapolis
Leopard, B. A.	Albert Lea
Lepak, F. J.	Duluth
Lepak, J. A.	St. Paul
Lerche, William	Cable, Wis.
Leven, N. L.	St. Paul
Levin, B. G.	St. Paul
Levitt, G. X.	St. Paul
Lewis, A. J.	Henning
Lewis, C. B.	St. Cloud
Lewis, E. B.	Rochester
Lexa, F. J.	Lonsdale
Libert, J. N.	St. Cloud
Lick, C. L.	St. Paul
Liedloff, A. G.	Mankato
Liffrig, W. W.	Goodhue
Lillehei, E. J.	Robbinsdale
Lillie, H. I.	Rochester
Lima, L. R.	Montevideo
Limbert, E. M.	Rochester
Lind, C. J.	Minneapolis
Lindberg, A. L.	Wheaton
Linde, Herman	Cyrus
Lindgren, R. C.	Minneapolis
Lindquist, R. H.	Minneapolis
Lindsay, W. V.	Winona
Linner, H. P.	Minneapolis
Linton, W. B.	Minneapolis
Lipp, F. E.	Appleton
Lippman, E. S.	Minneapolis
Lippman, H. S.	St. Paul
Lippmann, E. W.	Hutchinson
Lipschultz, Oscar	Minneapolis
Litchfield, J. T.	Minneapolis
Litman, A. B.	Minneapolis
Litman, S. N.	Duluth
Little, W. J.	St. Paul
Litzenberg, J. C.	Minneapolis
Livingstone, J. W.	Hudson, Wis.
Lloyd, H. J.	Mankato
Lloyd, S. J.	Rochester
Lochead, D. C.	Rochester
Lockwood, W. W.	Fort Peck, Mont.
Logan, A. H.	Rochester
Logan, G. B.	Rochester
Logefeil, R. C.	Minneapolis
Lohmann, J. G.	Jasper
Loken, Theodore	Ada
Lommen, P. A.	Austin
Long, Jesse	Minneapolis
Loofbourrow, E. H.	Keewatin
Loomis, E. A.	Minneapolis
Loomis, G. L.	Winona
Love, F. A.	Carlos
Love, J. G.	Rochester
Lovelace, W. R.	Rochester
Lovelady, S. B.	Rochester
Lowe, E. R.	So. St. Paul
*Lowe, Thomas	Pipestone
Lowe, T. A.	So. St. Paul
Luden, Georgine	Victoria, B. C., Canada
Luedtke, G. H.	Fairmont
Lufkin, C. D.	Northfield
Lufkin, N. H.	Minneapolis
Lund, C. J. T.	Underwood
Lund, W. J.	Staples
Lundblad, R. A.	Minneapolis
Lundblad, S. W.	Minneapolis
Lundgren, A. C.	Minneapolis
Lundholm, A. M.	St. Paul
Lundquist, E. F.	Minneapolis
Lundy, J. S.	Rochester
Lutz, E. H.	Willmar
Lyght, C. E.	Northfield
Lynch, F. W.	St. Paul
Lynch, M. J.	Minneapolis
Lynde, O. G.	Thief River Falls
Lysne, Henry	Minneapolis
Lysne, Myron	Minneapolis

Macbeth, J. L.	St. Clair
MacDonald, A. E.	Minneapolis
MacDonald, D. A.	Minneapolis
Macey, H. B.	Rochester
MacFarlane, P. H.	Chisholm
Mach, F. B.	Minneapolis
Mack, J. J.	Little Rock, Ark.
MacKay, A. R.	Rochester
MacKinnon, D. C.	Minneapolis
Macklin, W. E., Jr.	Litchfield
MacLean, A. R.	Rochester
Macnie, J. S.	Minneapolis
MacRae, G. C.	Duluth
Madden, J. F.	St. Paul
Madding, G. F.	Rochester
Madland, R. S.	Fairfax
Maeder, E. C.	Minneapolis
Maertz, W. F.	New Prague
Magath, T. B.	Rochester
Magney, F. H.	Duluth
Mahle, D. G.	Plainview
Mahowald, Aloys	Albany
Maitland, D. P.	Jackson
Maitland, E. T.	Jackson
Maland, C. O.	Minneapolis
Malerich, J. A.	Shakopee
Malloy, J. F.	Thief River Falls
Malmstrom, J. A.	Virginia
Manley, J. R.	Duluth
Manley, L. V.	Northampton, Mass.
Mann, A. S.	Rochester
Mann, F. C.	Rochester
Marcley, D. M.	Rochester
Marcley W. J.	Nopeming
Marcum, E. H.	Bemidji
Mariette, E. S.	Oak Terrace
Mark, D. B.	Minneapolis
Marken, M. H.	Fairmont
Marking, G. H.	Osseo
Markoe, J. C.	St. Paul
Marks, R. W.	St. Paul
Marshall, Mary E.	Rochester
Martin, E. T.	Duluth
Martin, T. P.	Arlington
Martin, W. C.	Duluth
Martineau, J. L.	St. Paul
Martinson, C. J.	Wayzata
Mason, J. A.	International Falls
Mass, Max	Chicago
Masson, D. M.	Rochester
Masson, J. C.	Rochester
Matchan, G. R.	Minneapolis
Matthews, Justus	Minneapolis
Matthews, M. W.	Rochester
Mattill, P. M.	Oak Terrace
Mattison, P. A.	Winona
Mattson, C. H.	Duluth
Mattson, H. A. N.	Minneapolis
Maxeiner, S. R.	Minneapolis
May, W. H.	Minneapolis
Mayne, R. M.	Duluth
Mayo, C. H.	Rochester
Mayo, C. W.	Rochester
Mayo, W. J.	Rochester
Maytum, C. K.	Rochester
McBroom, D. E.	Cambridge
McCann, D. F.	Bemidji
McCann, E. J.	Fort Snelling
McCarten, F. M.	Stillwater
McCarthy, Donald	Minneapolis
McCarthy, J. J.	St. Paul
McCarthy, W. J.	Madelia

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*Deceased.

McCarthy, W. R.	St. Paul
McCartney, J. S.	Minneapolis
McCarty, P. D.	Ely
McCarty, W. C.	Rochester
McClanahan, J. H.	White Bear Lake
McClanahan, T. S.	White Bear Lake
McComb, C. F.	Duluth
McCoy, Mary K.	Duluth
McCrea, James	Fulda
McCullough, J. A. L.	Rochester
McDaniel, Orianna	Minneapolis
McDaniel, S. P.	Virginia
McDonald, A. L.	Duluth
McDonald, J. R.	Rochester
McDonough, F. E.	Rochester
McDowell, J. P.	St. Cloud
McElmeel, E. F.	Pipestone
McEnaney, C. T.	Owatonna
McFarland, A. H.	Minneapolis
McGandy, R. F.	Minneapolis
McGeary, G. E.	Minneapolis
McGroarty, J. J.	Easton
McGuigan, H. T.	Red Wing
McHaffie, O. L.	Duluth
McInerny, M. W.	Minneapolis
McIntire, H. M.	Waseca
McIntyre, George	Long Beach, Calif.
McIntyre, J. A.	Owatonna
McIver, B. A.	Lowry
McKaig, C. B.	Pine Island
McKean, F. F.	Delavan
McKean, R. S.	Rochester
McKenna, J. K.	Austin
McKenna, M. J.	Grand Rapids
McKenzie, C. H.	Minneapolis
McKeon, J. O.	Montgomery
McKinlay, C. A.	Minneapolis
McKinley, J. C.	Minneapolis
McKinney, F. S.	Minneapolis
McKinnon, D. A., Jr.	Rochester
McLane, Evelyn M. G.	Jackson
McLane, W. O.	Jackson
McLaren, Jennette M.	Minneapolis
McLaughlin, E. M.	Winona
McLeod, J. L.	Grand Rapids
McMahon, L. H.	Breckenridge
McMahon, M. J.	Green Isle
McManamy, E. P.	Rochester
McNevin, C. F.	St. Paul
McNutt, J. R.	Duluth
McPheeters, H. O.	Minneapolis
McQuarrie, Irvine	Minneapolis

Mead, C. H.	Duluth
Meade, J. R.	St. Paul
Mears, B. J.	St. Paul
Mecray, P. M., Jr.	Rochester
Medelman, J. P.	St. Paul
Meinert, A. E.	Winona
Meland, E. L.	Minneapolis
Melby, Bendik	Blooming Prairie
Mellby, O. F.	Thief River Falls
Melzer, G. R.	Lyle
Mercil, W. F.	Crookston
Merkert, C. E.	Minneapolis
Merkert, G. L.	Minneapolis
Merrill, Elisabeth	Minneapolis
Merriman, L. L.	Duluth
Merritt, W. A.	Rochester
Mesker, G. H.	Olivia
Meyer, A. A.	Melrose
Meyer, E. L.	Minneapolis
Meyer, F. C.	Kenyon
Meyer, J. O.	Grand Rapids
Meyer, P. F.	Faribault
Meyerding, E. A.	St. Paul
Meyerding, H. W.	Rochester
Michael, J. C.	Minneapolis
Michel, H. H.	Minneapolis
Michelson, H. E.	Minneapolis
Miller, H. A.	Fairmont
Miller, H. E.	Minneapolis
Miller, J. C.	Minneapolis
Miller, J. M.	Rochester
Miller, V. I.	Mankato
Miller, W. A.	New York Mills
Mills, J. L.	Winnebago
Milton, J. S.	Minneapolis
Miners, G. A.	Deer River
Mingo, F. E.	Hugo
Mitchell, E. C.	Minneapolis
Mitchell, R. S.	Grand Meadow
Moberg, C. W.	Lake Park
Moe, J. H.	Minneapolis
Moe, R. J.	Duluth
Moe, Thomas	Moose Lake
Moen, J. K., Jr.	Minneapolis
Moersch, F. P.	Rochester
Moersch, H. J.	Rochester
Moga, J. A.	St. Paul
Mogilner, S. N.	St. Paul
Moir, W. W.	Minneapolis
Molander, H. A.	St. Paul
Monroe, P. B.	Two Harbors
Monson, E. M.	Minneapolis
Monson, L. J.	Hendricks
Montgomery, Hamilton	Rochester
Mooney, L. P.	Graceville
Moorhead, Martha B.	Minneapolis
Moquin, Marie A.	St. Paul
Moran, Tersa R.	Phoenix, Ariz.
More, C. W.	Eveleth
Morehead, D. E.	Owatonna
Moren, Edward	Minneapolis
Morgan, H. O.	Amboy
Moriarty, Berenice	St. Paul
Moriarty, Cecile R.	Minneapolis
Morissette, Leopold	Rochester
Mork, B. O., Jr.	Worthington
Mork, B. O., Sr.	Worthington
Morley, G. A.	Crookston
Morlock, C. G.	Rochester
Morrison, A. W.	Minneapolis
Morrison, Charlotte J.	Minneapolis
Morrissey, F. B.	St. Paul
Morrow, J. J.	Austin
Morse, M. P.	Le Roy
Morse, R. W.	Minneapolis
Morsman, L. W.	Hibbing
Mortensbak, H. E.	Hanska
Morton, H. McI.	Vincentown, N. J.
Mosby, M. E.	Long Prairie
Moses, Joseph, Jr.	Northfield
Mountain, G. E.	Rochester
Mouritsen, G. J.	Fergus Falls
Moss, M. N.	St. Paul
Mousel, L. H.	Rochester
Moyer, R. E.	Faribault
Moynihan, T. J.	St. Paul
Mueller, R. F.	Two Harbors
Mueller, Selma C.	Duluth
Muir, W. F.	Graceville
Muller, R. T.	St. Paul
Mulligan, A. M.	Brainerd
Mulrooney, R. E.	Rochester
Mundell, B. J.	Washington, D. C.
Munn, Elizabeth L.	Rochester
Murphy, E. P.	Minneapolis
Murphy, I. J.	Minneapolis
Murray, R. A.	Aitkin
Mussey, R. D.	Rochester
Myers, J. A.	Minneapolis
Myers, Thomas	St. Paul
Myre, C. R.	Paynesville

Naegeli, A. E.	St. Paul
Naegeli, Frank	Fergus Falls
Nagel, H. D.	Waconia
Nash, L. A.	Rochester
Naslund, A. W.	St. Paul
Nass, H. A.	Mabel
Nauth, W. W.	Winona
Neal, J. M.	Minneapolis
Nealy, D. E.	Adrian
Neary, R. P.	Minneapolis
Neel, H. B.	Rochester
Neff, W. S.	Virginia
Neher, F. H.	St. Paul
Neilson, H. F.	Minneapolis
Nelson, E. H.	Chisholm
Nelson, E. J.	Owatonna
Nelson, H. E.	Crookston
Nelson, H. S.	Excelsior
Nelson, K. L.	St. Paul
Nelson, L. A.	St. Paul
Nelson, M. S.	Granite Falls
Nelson, N. H.	Minneapolis
Nelson, N. P.	Brainerd
Nelson, O. L. N.	Minneapolis
Nelson, R. L.	Duluth
Nelson, W. I.	Minneapolis
Nelson, W. O. B.	Fergus Falls
Nesbitt, Samuel	Rochester
Ness, Claire M.	Cambridge
Neumaier, Arthur	Lindstrom
Neumann, C. A.	Winona
New, G. B.	Rochester
Newhart, Horace	Minneapolis
Nichols, A. E.	St. Paul
Nicholson, M. A.	Duluth
Nilles, L. J.	Rollingstone
Nilson, H. J.	North Mankato
Ninneman, N. N.	Silver Lake
Nissen, A. S.	St. Peter
Noble, J. F.	St. Paul
Noble, J. L.	St. Paul
Nordholm, V. W.	Red Wing
Nordin, G. T.	Minneapolis
Nordland, Martin	Minneapolis
Nordman, W. F.	Mora
Norman, J. F.	Crookston
Norris, E. H.	Detroit, Mich.
Norris, N. T.	Caledonia
Noth, H. W.	Minneapolis
Novak, E. E.	New Prague
Nuebel, C. J.	St. Paul
Nuessle, W. G.	Springfield
Nuetzman, A. W.	Faribault
Nutting, R. E.	Duluth
Nydahl, M. J.	Minneapolis
Nye, Katherine A.	St. Paul
Nye, Lillian L.	St. Paul
Nygren, W. T.	Braham
Nylander, E. G.	Minneapolis
Nystrom, Ruth G.	Minneapolis

Oberg, C. M.	Minneapolis
O'Brien, J. P.	Rochester
O'Brien, W. A.	Minneapolis
O'Brien, W. M.	St. Paul
Ochsner, C. G.	Wabasha
O'Connor, L. J.	St. Paul
Odel, H. M.	Rochester
O'Donnell, D. M.	Ortonville
O'Donnell, J. E.	Minneapolis
Oeljen, S. C. G.	Waseca
Oerting, Harry	St. Paul
Ogden, Warner	St. Paul
Ohage, Justus, Jr.	St. Paul
O'Hanlon, J. A.	Proctor
Ohnstad, J. L.	McIntosh
Olds, G. H.	Waseca
Olds, J. W.	Rochester
O'Leary, P. A.	Rochester
Oliver, C. I.	Graceville
Oliver, I. L.	Graceville
Olmanson, E. G.	St. Peter
Olsen, A. M.	Rochester
Olsen, E. G.	Minneapolis
Olson, A. C.	Minneapolis
Olson, A. E.	Duluth
Olson, A. O.	Duluth
Olson, C. A.	St. Paul
Olson, C. J.	Belle Plaine
Olson, D. C.	Gaylord
Olson, E. A.	Pine Island
Olson, F. A.	Minneapolis
Olson, G. E.	West Concord
Olson, K. L.	Gibbon
Olson, O. A.	Minneapolis
Olson, R. G.	Minneapolis
Onsgard, L. K.	Houston
Oppegaard, C. L.	Crookston
Oppegaard, M. O.	Crookston
Oppen, E. G.	Minneapolis
O'Reilley, B. E.	St. Paul
Ormond, D. T.	Waconia
Osborn, Lida	Mankato
Osburn, B. F.	International Falls
Ostergren, E. W.	St. Paul
Otto, H. C.	Frazee
Ouellette, A. J.	St. Paul
Overpeck, O. D.	Rochester
Owre, Oscar	Minneapolis

Page, C. V.	St. Paul
Page, R. L.	St. Charles
Palmer, C. F.	Albert Lea
Palmer, W. L.	Albert Lea
Pankratz, P. J.	Mountain Lake
Pansch, F. N.	Rochester
Paradis, W. G.	Crookston
Parker, O. W.	Ely
Parker, R. L.	Rochester
Parker, W. H.	Chisholm
Parkhill, Edith M.	Rochester
Parson, L. R.	Elbow Lake
Parsons, J. G.	Crookston
Pasek, A. W.	Cloquet
Passer, A. A.	Olivia
Pastore, P. N.	Rochester
Patterson, W. E.	Minneapolis
Patterson, W. L.	Fergus Falls
Patton, G. D.	Rochester
Paulsen, E. L.	Minneapolis
Paulson, D. L.	Rochester
Paulson, J. A.	Rochester
Paulson, T. S.	Fergus Falls
Pearman, R. O. D.	Rochester
Pearsall, R. P.	Virginia
Pearson, B. F.	Shakopee
Pearson, F. R.	St. Paul
Pedersen, A. H.	St. Paul
Pederson, R. M.	Minneapolis
Pelant, F. J.	New Ulm
Pellettiere, E. V.	Thief River Falls
Pemberton, J. deJ.	Rochester
Penhall, F. W.	Morton
Penn, G. E.	Mankato
Pennie, D. F.	Duluth
Pennington, Reuben	Minneapolis

Peppard, T. A.	Minneapolis
Perozzi, Thelma	Rochester
Perry, C. G.	St. Paul
Pertl, A. L.	Canby
Petersen, J. R.	Minneapolis
Petersen, M. C.	Willmar
Petersen, P. C.	Braham
Petersen, Thorvald	Minneapolis
Peterson, A. A.	Mora
Peterson, D. B.	St. Paul
Peterson, E. N.	Virginia
Peterson, H. O.	Minneapolis
Peterson, H. W.	Minneapolis
Peterson, J. H.	Duluth
Peterson, J. L. E.	St. Paul
Peterson, N. P.	Minneapolis
Peterson, O. H.	Minneapolis
Peterson, O. L.	Cokato
Peterson, P. E.	Minneapolis
Peterson, R. A.	Vesta
Peterson, S. C.	Grove City
Peterson, V. N.	St. Paul
Peterson, W. C.	Minneapolis
Peterson, W. H.	Minneapolis
Petit, L. J.	Minneapolis
Petraborg, H. T.	Aitkin
Pettit, C. W.	Minneapolis
Peyton, W. T.	Minneapolis
Pfunder, M. C.	Minneapolis
Phelps, K. A.	Minneapolis
Phillips, A. E.	Delano
Phillips, W. H.	Jordan
Pierce, C. H.	Wadena
Piper, M. C.	Rochester
Piper, W. A.	Mountain Lake
Platou, E. S.	Minneapolis
Plondke, F. J.	St. Paul
Plonske, C. J.	Faribault
Plowman, E. T.	Marble
Plummer, W. A.	Rochester
Pogue, R. E.	Watertown
Pohl, J. F.	Minneapolis
Poirier, J. A.	Forest Lake
Pollard, D. W.	Minneapolis
Pollock, D. K.	Minneapolis
Pollock, G. A.	Rochester
Pollock, L. W.	Rochester
Polzak, J. A.	Minneapolis
Pool, T. L.	Rochester
Popp, W. C.	Rochester
Poppe, F. H.	Minneapolis
Potek, David	International Falls
Potter, R. B.	Hendricks
Potthoff, C. J.	Minneapolis
Power, J. E.	Duluth
Powers, F. H.	Rochester
Powers, F. W.	Barrett
Prangen, A. D.	Rochester
Pratt, F. J.	Minneapolis
Pratt, J. A.	Minneapolis
Preine, I. A.	Minneapolis
Preisinger, J. W.	Renville
Prendergast, H. J.	St. Paul
Prendergast, J. J.	St. Paul
Prickman, L. E.	Rochester
Priestley, J. T.	Rochester
Prim, J. A.	Minneapolis
Prins, L. R.	Albert Lea
Proeschel, R. K.	Willmar
Proshek, C. E.	Minneapolis
Pugh, D. G.	Rochester
Pumphrey, R. E.	Rochester
Purves, G. H.	Lake Benton
Puumala, R. H.	Cloquet
Quade, R. H.	Rochester
Quanstrom, V. E.	Brainerd
Quello, R. O. B.	Minneapolis
Quill, T. H.	Rochester
Quinby, T. F.	Lake Wales, Fla.
Quist, H. W.	Minneapolis
Raadquist, C. S.	Hibbing
Radabaugh, R. C.	Hastings
Raihala, John	Virginia
Raiter, F. W. S.	Cloquet
Raiter, R. F.	Cloquet
Ralph, R. D.	Rochester
Ramsey, W. R.	St. Paul
Randall, A. M.	Ashby
Randall, K. C., II	Rochester
Randall, L. M.	Rochester
Ransom, M. L.	Hancock
Rasmussen, R. C.	St. Paul
Rasmussen, T. B.	Rochester
Ratcliffe, J. J.	Aitkin
Rathbun, C. A.	St. Cloud
Raymond, J. H.	Triumph
Reed, C. A.	Minneapolis
Reeve, E. A. T.	Elbow Lake
Redding, M. D.	Rochester
Reff, A. R.	Crookston
Regan, J. F.	Rochester
Regnier, E. A.	Minneapolis
Reichelderfer, C. F.	Staples
Rein, G. N.	Rochester
Reineke, G. F.	New Ulm
Reiter, H. W.	Shakopee
Replogle, W. H.	Wabasha
Rewbridge, A. G.	Minneapolis
Reynolds, J. S.	Minneapolis
Rice, C. O.	Minneapolis
Rice, H. G.	Moorhead
Rice, H. R.	Roseau
Richards, E. T. F.	St. Paul
Richards, W. B.	St. Cloud
Richardson, F. S.	Minneapolis
Richardson, H. E.	St. Paul
Richardson, W. E.	Rushford
Richdorf, L. F.	Minneapolis
Rick, P. F. W.	St. Paul
Ridgway, A. M.	Annandale
Rieke, W. W.	Wayzata
Rigler, L. G.	Minneapolis
Rimer, E. W.	Breckenridge
Ringle, O. F.	Walker
Risch, R. E.	Minneapolis
Rishmiller, J. H.	Minneapolis
Risser, A. F.	Stewartville
Risser, E. D.	Winona
Ritchie, H. P.	St. Paul
Ritchie, W. P.	St. Paul
Ritt, A. E.	St. Paul
Rivers, A. B.	Rochester
Rizer, R. I.	Minneapolis
Roan, C. M.	Minneapolis
Robb, E. F.	Minneapolis
Robbins, C. P.	Winona
Robbins, O. F.	Minneapolis
Roberts, L. M.	Little Falls
Roberts, O. W.	Owatonna
Roberts, T. S.	Minneapolis
Roberts, W. B.	Minneapolis
Robertson, F. O.	East Grand Forks
Robertson, H. E.	Rochester
Robertson, J. B.	Minneapolis
Robertson, P. A.	Austin
Robilliard, C. M.	Faribault
Robitshek, E. C.	Minneapolis
Rochford, W. E.	Minneapolis
Rodda, F. C.	Minneapolis
Roehlke, A. B.	Elk River
Roemer, H. J.	Winona
Rogers, S. F.	St. Paul
Rogne, W. G.	Spring Grove
Roholt, C. L.	Waverly
Rohrer, C. A.	Waterville
Rokala, H. E.	Biwabik
Rolig, D. H.	Howard Lake
Rood, D. C.	Duluth
Rose, J. T.	Lakefield
Rosen, Samuel	Minneapolis
Rosenberg, E. F.	Rochester
Rosenbladt, Louis	St. Paul
Rosenfield, A. B.	Hibbing
Rosenholtz, B. I.	St. Paul
Rosenow, E. C.	Rochester
Rosenow, E. C., Jr.	Rochester
Rosenstiel, H. C.	Rochester
Rosenthal, F. H.	Grand Meadow
Rosenthal, Robert	St. Paul
Rosenwald, R. M.	Minneapolis
Rossen, R. X.	Hastings
Roth, F. D.	Lewiston
Rothenburg, J. C.	Springfield
Rothrock, J. L.	St. Paul
Rothschild, H. J.	St. Paul
Rousseau, Victor	Maple Lake
Roust, H. A.	Montevideo
Rowe, O. W.	Duluth
Rowe, W. H.	Fairmont
Rowles, E. K.	Coleraine
Roxburgh, D. B.	Rochester
Roy, J. A.	Red Lake Falls
Roy, P. C.	St. Paul
Rucker, C. W.	Rochester
Rucker, W. H.	Minneapolis
Rud, N. E.	Minneapolis
Rudell, G. L.	Minneapolis
Rudie, C. N.	Kenyon
Rudie, P. S.	Duluth
Ruggles, G. M.	Forest Lake
Ruhberg, G. N.	St. Paul
Rumpf, C. W.	Faribault
Rumpf, W. H., Jr.	St. Cloud
Rumpf, W. H.	Faribault
Rushton, J. G.	Rochester
Russ, H. H.	Blue Earth
Russeth, A. N.	Minneapolis
Rusten, E. M.	Minneapolis
Rutherford, W. C.	St. Paul
Rutledge, D. I.	Rochester
Rutledge, L. H.	Detroit Lakes
Ryan, J. J.	St. Paul
Ryan, J. M.	St. Paul
Ryan, M. E.	St. Paul
Ryan, W. J.	Duluth
Rynearson, E. H.	Rochester
Sach-Rowitz, Alvan	Moose Lake
Sadler, W. P., Jr.	Minneapolis
Saffert, C. A.	New Ulm
Sahr, W. G.	Hutchinson
St. Cyr, K. J.	Osseo
Salt, C. G.	Minneapolis
Salter, R. A.	Virginia
Samson, E. R.	Stillwater
Samuelson, L. G.	Mankato
Samuelson, Samuel	Minneapolis
Sanderson, E. T.	Minneota
Sandt, K. E.	Minneapolis
Sandven, N. O.	Paynesville
Sanford, A. H.	Rochester
Sarff, O. E.	Virginia
Sarnecki, M. M.	St. Paul
Satersmoen, Theodore	Pelican Rapids
Sather, E. R.	Alexandria
Sather, G. A.	Fosston
Sather, R. O.	Crookston
Satterlee, H. W.	Lewiston
Satterlund, V. L.	St. Paul
Savage, F. J.	St. Paul
Sawatzky, W. A.	Minneapolis
Sawyer, M. H.	Rochester
Sax, S. G.	Duluth
Schaaf, F. H. K.	Minneapolis
Schade, F. L.	Worthington
Schaefer, J. F.	Owatonna
Schaefer, Samuel	Winona
Schaefer, W. G.	Minneapolis
Schatz, F. J.	St. Cloud
Scheldrup, N. H.	Minneapolis
Scherer, C. A.	Duluth
Scherer, L. R.	Minneapolis
Schiele, B. C.	Minneapolis
Schimelpfenig, G. T.	Chaska
Schlesselman, G. H.	Anoka
Schlesselman, J. T.	Mankato
Schlicke, C. P.	Rochester
Schmidt, G. F.	Minneapolis
Schmidt, H. W.	Rochester
Schmidt, P. A.	Good Thunder
Schmidt, P. G., Jr.	Granite Falls
Schmidt, W. R.	Glencoe
Schmitt, A. F.	Minneapolis
Schmitt, G. F., Jr.	Rochester
Schmitt, S. C.	Los Angeles, Calif.
Schneider, H. H.	Rochester
Schneider, J. P.	Minneapolis
Schneider, P. J.	Adams
Schoch, R. B. J.	St. Paul
Scholpp, O. W.	Hutchinson
Schons, Edward	St. Paul
Schottler, G. J.	Dexter
Schottler, M. E.	Minneapolis
Schroder, C. H.	Duluth
Schroeppel, J. E.	Winthrop
Schuele, D. T.	Albert Lea
Schuldt, F. C.	St. Paul
Schulte, T. L.	Rochester
Schultz, J. A.	Albert Lea
Schultz, P. J.	Minneapolis
Schulze, A. G.	St. Paul
Schunke, G. B.	Rochester
Schussler, O. F.	Minneapolis
Schutz, E. S.	Mountain Lake
Schwartz, V. J.	Minneapolis
Schweiger, L. R.	Rochester
Schweiger, T. R.	Hibbing
Schwyzer, Arnold	St. Paul
Schwyzer, Gustav	Minneapolis
Scofield, C. L.	Benson
Scott, E. E.	St. Paul
Scott, F. H.	Minneapolis
Scott, H. G.	Minneapolis
Searles, P. W.	Buffalo, N. Y.
Seashore, Gilbert	Minneapolis
Seashore, R. T.	Duluth
Secord, E. W.	Rochester
Seedorf, E. E.	Rochester
Seeley, I. F.	Northfield
Seham, Max	Minneapolis
Seifert, M. H.	Excelsior
Seifert, O. J.	New Ulm
Seitz, S. B.	Barnesville
Seldon, T. H.	Rochester
Seljeskog, S. R.	Minneapolis
Selleseth, I. F.	Minneapolis
Senkler, G. E.	St. Paul
Senn, E. W.	Owatonna
Serkland, J. C.	Rothsay

Sessions, J. C.	Minneapolis
Sether, A. F.	Ruthton
Settlage, A. F. E.	Worthington
Setzer, H. J.	St. Paul
Shaleen, A. W.	Hallock
Shannon, S. S.	Crosby
Shannon, W. R.	St. Paul
Shaperman, Eva P.	Minneapolis
Shapiro, E. Z.	Duluth
Shapiro, M. J.	Minneapolis
Sharp, D. V.	Minneapolis
Sharpe, W. S.	Rochester
Shastid, T. H.	Duluth
Shaw, A. W.	Virginia
Shedlov, Abraham	Fosston
Sheedy, C. L.	Austin
Sheedy, L. P.	Rochester
Shelden, W. D.	Rochester
Sheldon, C. H.	Rochester
Shellman, J. L.	St. Paul
Shelver, H. J.	Ortonville
Shephard, V. D.	Rochester
Sheppard, C. G.	Hutchinson
Sheppard, Fred	Hutchinson
Sheppard, P. E.	Hutchinson
Sher, D. A.	Cold Spring
Sherman, C. L.	Luverne
Sherwood, G. E.	Kimball
Shillington, M. A.	Glendive, Mont.
Shimonek, S. W.	St. Paul
Shoemaker, Rosemary	Des Moines, Iowa
Short, Jacob	St. Paul
Shrader, J. S.	Marietta
Sickler, J. R.	Rochester
Siegmann, W. C.	Minneapolis
Silver, J. D.	Minneapolis
Simison, Carl	Barnesville
Simison, C. W.	Hawley
Simons, B. H.	Chaska
Simons, E. J.	Swanville
Simons, J. H.	Minneapolis
Simons, L. T.	St. Paul
Simonton, K. M.	Rochester.
Simpson, E. D.	Minneapolis
Sinamark, Andrew	Hibbing
Singer, B. J.	St. Paul
Siperstein, D. M.	Minneapolis
Sisler, C. E.	Grand Rapids
Sivertsen, Andrew	Mound
Sivertsen, Ivar	Minneapolis
Sjostrom, L. E.	Storden
Skinner, H. O.	St. Paul
Skinner, I. C., Jr.	Rochester
Skjold, A. C.	Minneapolis
Slater, S. A.	Worthington
Sloan, Julius	Minneapolis
Slocumb, C. H.	Rochester
Slocumb, J. A.	Plainview
Slyfield, F. F.	Duluth
Smisek, E. A.	St. Paul
Smisek, F. M. E.	Minneapolis
Smith, A. E.	Minneapolis
Smith, Archie M.	Minneapolis
Smith, A. M.	Minneapolis
Smith, B. A.	Crosby
Smith, B. F.	Rochester
Smith, C. H.	New Hampton, Iowa
Smith, C. M.	Duluth
Smith, F. A.	Rochester
Smith, F. D.	Rochester
Smith, F. L.	Rochester
Smith, H. L.	Rochester
Smith, H. R.	Minneapolis
Smith, K. A.	Rochester
Smith, L. A.	Balaton
Smith, L. A.	Rochester
Smith, L. G.	Montevideo
Smith, M. W.	Red Wing
Smith, N. D.	Rochester
Smith, N. M.	Minneapolis
Smith, R. L., Jr.	Rochester
Smith, S. T.	Eveleth
Smith, V. D. E.	St. Paul
Smith, W. R.	Grand Marais
Snell, A. M.	Rochester
Snyder, G. W.	St. Paul
Snyder, J. M.	Rochester
Soderlind, R. T.	Minneapolis
Sogge, L. L.	Windom
Sohlberg, O. I.	St. Paul
Sohmer, A. E.	Mankato
Solhaug, S. B.	Minneapolis
Sommer, A. W.	Elmore
Soniat, T. L. L.	Rochester
Sonnesyn, N. N.	Le Sueur
Souster, B. B.	St. Paul
Spang, A. J.	Duluth
Spano, J. P.	Minneapolis
Sperling, Louis	Minneapolis
Spicer, F. W.	Duluth
Spink, W. W.	Minneapolis
Sprafka, J. M.	St. Paul
Sprague, R. G.	Rochester
Spratt, C. N.	Minneapolis
Spurbeck, R. G.	Cloquet
Spurzem, R. J.	Anoka
Squire, E. W.	Rochester
Stafford, D. E.	Rochester
Stafne, W. A.	Moorhead
Stalker, L. K.	Rochester
Stanford, C. E.	Minneapolis
Stangl, F. H.	St. Cloud
Stangl, P. E.	St. Cloud
Stanley, C. R.	Worthington
Stebbins, T. L.	Minneapolis
Steffens, L. A.	Red Wing
Steffens, L. F.	Rochester
Stein, R. J.	Pierz
Steinberg, C. L.	St. Paul
Steiner, I. W.	Winona
Stelter, L. A.	Minneapolis
Stemsrud, H. L.	Parkers Prairie
Stenstrom, Annette E. T.	Minneapolis
Stephan, E. L.	Hinckley
Sterner, E. G.	St. Paul
Sterner, E. R.	St. Paul
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PAGES' PERIDURAL ANESTHESIA*

A Report of 3,826 Cases

DR. VICENTE RUIZ
Buenos Aires, Argentina

SINCE the beginning of 1932, and for the first time in Argentina, we have been carrying out experiments at this clinic with a new anesthetic method, epidural or peridural anesthesia. This technic was devised in 1920 by a Spanish surgeon, Dr. Fidel Pagés. Since Pagés died prematurely and was able to publish only one paper, in 1921 (Revista Española de Cirugia) recording the results he obtained in forty-three cases, this new method passed almost unnoticed. A few years ago, however, Prof. Dogliotti,[3,4] of Prof. Uffreduzzi's clinic at Torino, described a technic bearing a remarkable similarity to that of Dr. Pagés'.

It should be mentioned that other investigators had previously tried a similar procedure, but their results were unsatisfactory. Among them was Corning, who in 1885 endeavored to modify spinal anesthesia, but without success. Later, Sicard (1901) and then Cathelin, advocated the use of epidural injections of anesthetics for therapeutic and surgical purposes, but they followed the sacral route and sought only to anesthetize the lowest spinal nerves. Other surgeons such as Laewen (1910), Tuffier, Reclus, Chipault, Hamecart, Schlimpert, Pauchet, Kroning, Schneider, Kehrer (1916), Stoeckel, and Bleek, injected sacrally larger quantities of anesthetic with a view of obtaining a higher zone of anesthesia. Some of these workers, besides performing epidural anesthesia, injected veronal, morphine, and scopolamine. This brief historical survey is important in that it will prevent one from mistaking Cathelin's sacral epidural anesthesia for the method we are about to describe. The former method is not used for operations in the abdomen, thorax, neck and limbs as is the latter.

The results obtained by the foregoing surgeons were on the whole unsatisfactory, as has already been stated. Epidural anesthesia fell therefore into disuse because of its irregular results and several fatal accidents. The technic conceived by Pagés surpasses the others in so far as it does away with the need for preliminary medication, is generally always harmless and yields consistent results.

At this point it is well to recall that there is no communication between the peridural and subarachnoid spaces, so that an anesthetic injected into the former cannot cause bulbar accidents. Besides, it should be borne in mind that the peridural space has a negative pressure, to which the "drop sign," to be described later, is due.

Technic

We use at this clinic an ordinary 10 cm. syringe, and a long, thin needle with a short bevelled edge, which was designed by Prof. Gutiérrez. The anesthetic employed is 1 per cent procaine (novocain) solution which is prepared at the moment of the operation; 1.20 grains of Bayer's, previously tyndallized, crystallized procaine is diluted in a wide-necked graded flask containing 60 c.c. of sterile physiologic saline solution. To this solution 10 drops of 1:1000 epinephrine solution are added; this delays absorption of the anesthetic by tightening the vessels, thus facilitating a more prolonged contact of the anesthetic with the spinal nerves.

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*From the Clinic of Prof. Alberto Gutiérrez, Spanish Hospital, Buenos Aires, Argentina.

After trying several solutions we have definitely adopted the 2 per cent solution because of its effective results and safety. When the anesthetic solution is ready we inject it with the patient in a sitting or lateral decubital position on the operating table. The former position is preferable, the latter being used only exceptionally (in the case of high-strung nervous patients, and so forth).

The technic followed in the first part of peridural anesthesia is just the same as that for spinal anesthesia; the spinous processes are palpated and the puncture is made medially or laterally. We prefer the middle line for the following reasons: (1) the peridural space is wider here, that is to say, there is a greater space between the dura mater and the yellow ligament, the endorachid veins, which are on the sides, are less likely to be injured, and (3) it is easier to make the puncture.

Site of puncture.—Experience has indicated that it is immaterial whether the puncture is made between the first and second lumbar vertebra, between the second and third, or between the third and the fourth; the last, however, is the zone we generally always choose. Puncture may also be made in the lower part of the thoracic column, but this we have seldom tried. By making the puncture between any of the lumbar vertebræ, anesthesia is produced that extends from the clavicle to the lower limbs, because when the solution spreads through the peridural space it reaches the spinal nerves. However, if only a small area of anesthesia is desired (it should be remembered that this anesthesia is metameric, and we can consequently choose the places where to make it), we should bear in mind the vertebroradicular and vertebromedullary topography and the fact that the innervation of the abdominal or thoracic wall does not correspond with the innervation of the viscera.[5]

"The drop sign."—After piercing the skin and the subcutaneous tissue with the needle and its mandrin, we reach the supraspinous ligament. Before continuing the puncture we withdraw the mandrin, take the syringe filled with the anesthetic solution and try to inject the liquid. Naturally, resistance is offered by the supraspinous ligament which hinders the entrance of the liquid; the syringe is then withdrawn and the liquid remains, filling the needle and its pavilion. We proceed now to drive the needle in, millimetrically, being careful that the thumb and forefinger do not cause the drop remaining in the pavilion to fall. The needle penetrates the supraspinous ligament; then the interspinous ligament and last the yellow ligament; this is felt, more or less clearly, with the fingers. When the tactile sensation is perceived (and sometimes there is a slight click, too), the drop is absorbed, sucked in by the negative pressure of the peridural space. Thus we are sure that the end of the needle is in the space. This fact was observed, for the first time by Prof. Gutiérrez, who called it the "drop sign." This sign, which is noticed in most cases, renders the technic of peridural anesthesia easier and places it within reach of a greater number of surgeons. The drop may be absorbed rapidly or slowly; in a few instances it suffers only a slight oscillation. At this moment the syringe filled with anesthetic solution is applied to the needle and it is seen that, when driving the piston, the liquid penetrates without difficulty, just as when making an intravenous injection, for instance.

When the point of the needle enters the yellow ligament it may happen that instead of the drop being absorbed, cerebrospinal fluid flows out; this may be due to two factors: (1) excessive penetration of the needle, or (2) the dura mater may adhere to the wall of the rachis, and the peridural space may be reduced to a minimum or may have disappeared. If the flow of cerebrospinal fluid is due to excessive penetration of the needle, which has perforated the dura mater the needle is withdrawn millimetrically, and, when the liquid stops flowing, we test with the mandrin to see that the needle is not obstructed. Then the patient is required to cough. Finally one can still make a further test by aspirating with the empty syringe. After all these tests have been carried out it is safe to begin the anesthesia. It may also happen that when driving the needle in it will come up against a vertebra, or owing to puncture of a vein, blood may flow; in both instances the needle should be withdrawn partially or totally and puncture should be begun anew.

From the foregoing it may be concluded that there are two ways of injecting procaine solution: a direct and an indirect way. Injection is direct when the needle is introduced into the peridural space only, and indirect when it is introduced into the subarachnoid space, as in spinal anesthesia. As soon as cerebrospinal fluid flows, the needle is withdrawn a few millimeters until the fluid stops flowing, thus indicating that the point of the needle has remained in the peridural space.

Once it is certain that the needle is in the peridural space, injection of the anesthetic is begun, usually by the fractional method, as we shall explain later. It is obvious that the direct way is preferable and we follow it in most cases.

The distance to which the needle penetrates before it reaches the peridural space varies greatly with different patients, since it depends on various anatomic factors; the extreme figures we have recorded range between 2 and 8 cm.

We consider the technic employed by us better than the one recently described by Dogliotti. The Torinese professor uses 30 to 60 c.c. of 1 to 1.5 per cent procaine solution, and he appears to prefer the lateral decubital position in making the injection and he does not seem to be acquainted with the "drop sign." He follows a method of reaching the peridural space which we do not deem absolutely without danger. Moreover we disagree with him when he says that peridural anesthesia should not be used for major operations on interior genital organs; our statistics in this respect are conclusive and prove otherwise.

Amount of solution to be injected.—From our experience we can state that the amount of solution to be injected and the procedure employed depend on the importance of the operation and the constitution and weight of the patient. For instance, we have performed appendicectomies with only 20 c.c. of a 2 per cent solution of procaine, and many operations with only 35 c.c., but to secure good anesthesia for any of the ordinary gynecologic procedures in the abdomen, however, 40 or 50 c.c. are injected. The solution should be introduced slowly either all at one time or in portions. In the latter case we inject 5 c.c. and then wait five minutes to ascertain the sensibility and motility of the lower limbs. Once we are positive we have not obtained spinal anesthesia the rest of the solution is injected. To those who try peridural anesthesia for the first time, we advise this procedure.

Effects of procaine anesthesia.—The reactions produced by procaine depend to a certain extent on the emotional stability of the patients and any idiosyncracy they may have. In some cases mere puncture of the skin is enough to produce sweating, fainting, pallor, and so forth. Most patients, however, tolerate the injection perfectly and it causes only slight pallor, dryness in the mouth, tachycardia, cardiac erethism and an epigastric beat due to erethism of the abdominal aorta. We are convinced that, provided the injection is well made, it very rarely causes any trouble.

In our clinic we record carefully on the "anesthetic file," all the sensations experienced by the patients. From a study of 500 files we have arrived at the following conclusions regarding modifications in arterial pressure: immediately after the puncture is made the previous maximal arterial pressure increases and the previous minimal pressure decreases, although to a lesser degree. At the end of the operation both maximal and minimal pressure are seen to have diminished in the same proportion. The pulse rate is quickened moderately after anesthesia and a slight increase is observed also at the end of the operation.

After the injection the patient is made to lie down and 0.25 gm. of caffeine is injected. A zone of anesthesia usually appears in the abdomen after some ten minutes, depending on the place where the puncture was made, and gradually this spreads upward and downward, producing insensibility to thermal pain and tactile anesthesia. This zone of anesthesia thus extends from the lower portion of the abdomen, in most cases after forty minutes up to the second intercostal space (and sometimes even up to the chin) and then down to the feet. Before beginning the operation it is usually necessary to wait for twenty-five to thirty minutes, although we have begun appendicectomies, for example, only ten minutes after the injection; this, however, is exceptional.

With the usual dose of 35 to 45 c.c. of procaine solution anesthesia lasts for from an hour to an hour and a half and, as a result of the great muscular relaxation and visceral immobility produced the most varied operations in the abdomen can be performed, so much so that in many cases the operation resembles dissection.

Sensibility to pain is the first thing to disappear, then the sense of touch and of heat. Tendinous and cutaneous reflexes are absent in the anesthetized area as well as visceral sensibility.

In a few cases, traction on the round ligaments, as when doing ligamentopexis, has provoked some transient nausea or vomiting, and this fact, observed from time to time, has shown the need for anesthetizing the solar plexus if absolute abdominal immobility is desired. This can be secured by puncturing between the first and second lumbar vertebræ. This procedure does not in the least interfere with the operation and takes but a short time to carry out.

I would like to emphasize the fact, however, that it is advisable to wait for some time (about twenty minutes) rather than to hasten to operate, as I have seen cases in which the zone of anesthesia increased after the operation was over. Above all it should not be forgotten that it is necessary to wait thirty minutes when operating on the perineum for it takes a longer time to produce anesthesia in this region.

The postoperative condition of the patient is quite satisfactory, since untoward reactions do not follow this method of anesthesia. Nausea and vomiting, which so often afflict those who are operated on by inhalation anesthesia, are reduced to a minimum and the headache and backache which are induced by spinal anesthesia are also absent. In only one case was rachialgia observed, and this only for a day, at the site of the puncture. As this was one of the first cases in which we attempted this form of anesthesia, pain was probably caused by the liquid being introduced in the interspinous or yellow ligaments. The advantages of peridural anesthesia can be appreciated not only during operation, but especially during the postoperative period when patients have undergone long and serious procedures.

Complications.—Before referring to the cases in which this method of anesthesia has been successful and summarizing the results obtained in our clinic in 3,826 cases, I shall dwell at some length on the enlightening and interesting subject of failures and accidents observed when using peridural anesthesia. In this respect we are very strict and class as failure either those cases in which anesthesia was not obtained or those in which it was incomplete or limited as well as when accidents occurred with its use.

In 1932, out of 202 cases, we had twelve failures; in six cases anesthesia was not obtained, while in the rest it was necessary to complete the operation with ether, chloroform, or by local anesthesia. However, of a total of 3,826 cases in which peridural anesthesia was performed, the number of failures was only forty-one, including cases in which only partial anesthesia was obtained.

This small number of failures could certainly be decreased still further by limiting the number of anesthetists, for in Prof. Gutiérrez' Service each surgeon anesthetizes his own patients and even general practitioners do it. Although the technic is not at all difficult, it requires a certain amount of skill which only practice can give. This and the fact that at first we used only a 1 per cent solution of procaine account for most of our early unsuccessful cases.

Failures and accidents with this form of anesthesia are due to various causes: (1) faulty technic, (2) use of too weak a solution, or (3) an insufficient amount of solution. I deliberately do not mention the possibility of some anatomic anomaly that might prevent the complete diffusion of the anesthetic or the fact that the patient may be "raqirresistente," or "spine resistant," as these circumstances might be too often invoked to justify failures. Generally speaking, lack of success can be traced to lack of ability on the part of the anesthetist, ignorance of some of the details of technic and lastly, to some very special instances of ossification of the supraspinous and interspinous ligaments, deviations or deformations of the spinal column, or obesity. Under those conditions even the most skillful anesthetist may fail. In this connection I may say that on two occasions, after having tried in vain to anesthetize the patient, they were left for a later operation, when puncture could be satisfactorily made.

It is to be regretted that some surgeons have tried Pagés' method without first having quite mastered its technic, so that failures and even sudden deaths have occurred. As a result these surgeons have passed an unfavorable judgment on peridural anesthesia apparently forgetting that a gram of procaine cannot be injected into the cerebrospinal fluid with impunity.

In the 3,826 cases in which peridural anesthesia was employed at our clinic we have had two serious accidents caused by the anesthetic and three fatal cases in which we feel certain that death was not caused by anesthesia, as necropsy, had we been able to make it, would have proved. The first case in which death occurred was that of a woman sixty years of age, who had mitral insufficiency. In an operation for hemorrhoids, 35 c.c. of procaine solution was injected; she underwent the operation well but, five minutes afterward, had a heart attack and died. In the second case the patient, fifty years old, had frequent arrhythmia. She had a uterine myoma and her physician refused radiotherapy. Puncture was difficult in this case because the adipose panniculus prevented palpation of the spinous process. Although she received an injection of 45 c.c. of procaine, a great part of the solution very likely remained out of the peridural space, as anesthesia was partial and the patient began to complain when the uterine pedicles were being held with the forceps. Ether was given to suture the abdominal wall and when the aponeurosis was being closed she had a syncopal attack and died. The third case was that of a woman, forty-five years of age, who had intestinal occlusion and peritonitis of forty-eight hours' duration. Death occurred when the abdomen was being sutured.

As to the serious accidents, one happened while Dr. Gutiérrez was giving the anesthetic, in the other I was the anesthetist. In the first case the patient had a hydatid cyst on the upper surface of the liver; puncture was made indirectly, between the third and fourth lumbar vertebræ. Shortly after injection respiratory, and later cardiac, paralysis developed, but this was treated with adequate medication. As this accident has been explained at length in a previous report, I shall note here only that three weeks afterward, the patient was operated on successfully using peridural anesthesia. The second accident was that which befell a patient of mine, a woman forty years of age. She was in an undernourished condition and a Wertheim operation was to be performed. Both ureters were catheterized and puncture was then made with the patient in the left lateral decubital position. The "drop sign" was positive. Forty-seven c.c. of 2 per cent procaine solution had been injected when the patient felt slightly giddy. The pulse was soft but even and had a rate of 85 beats per minute. The maximal arterial pressure was 10 and the minimum 4 c. At this time the patient said in a weak voice that she could not breathe well. The pulse continued soft and regular and the thorax, with the intercostal spaces slightly shrunk, hardly moved. Seeing that the patient did not react to the medication given, we employed artificial respiration for three hours. At the end of two and a half hours, she began to breathe irregularly and intermittently, later deeply and rhythmically. Consciousness came back with the respiratory movements, the conjunctival reflex returned and mydriasis disappeared. All of this time the heart beat regularly, although at times it was difficult to feel the radial pulse. Cyanosis was not observed nor were the limbs cold. When the patient recovered, her pulse was regular and beat at the rate of 63 per minute.

In this case the positive "drop sign" eliminated the possibility of penetration of the anesthetic solution into the subarachnoid space and its mingling with the cerebrospinal fluid. The accident was of a respiratory type: paralysis of the diaphragm and of the intercostal muscles. Was it due to anesthesia of the phrenic nerve, or were the intercostal nerves inhibited at first and did the diaphragm then become fatigued, producing reflex bulbar anoxemia? Shrinking of the intercostal spaces leads us to think the last hypothesis is the true one. Rapid diffusion of the anesthetic liquid into the peridural space in addition to the fact that the patient was in the left lateral decubital position and was in an undernourished condition, must have caused the accident. A month later this patient was operated on successfully using 45 c.c. of procaine solution by the peridural route.

Results*

Our 3,826 patients varied between fifteen and seventy-eight years of age, and underwent a variety of operations, such as, gastrectomy, gastroenterostomy, resection of the intestine, abdominoperineal procedures, appendicectomy, herniorrhapy, cholecystectomy, cholecystostomy, operations for cysts of the liver, nephrocolopexy, nephrostomy, nephrectomy, operations for retroperitoneal tumors, Albee operations with costal graft, osteotomy, amputation, and extirpations of the mammary gland including the pectoral muscles and axillary ganglions.

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*Editor's Note.—In a letter dated April 17, 1939, at Buenos Aires, Dr. Ruiz writes: "At present, the number of cases in which peridural anesthesia has been used at our Spanish Hospital, is over 5,300."

Of the 962 gynecologic operations performed up to May 1, 1937, 735 were by the abdominal route, 227 by the vaginal route.[18] While we have performed every kind of gynecologic operation using this method, for the sake of brevity we will refer only to two cases which afford ample evidence of the advantages of peridural anesthesia. One patient was a woman without a vagina for whom the Baldwin-Mori operation was carried out by Dr. A. Gutiérrez, using 50 c.c. of procaine solution; anesthesia lasted for two and a half hours and only at the end was it necessary to give ether. The patient underwent the operation satisfactorily and the postoperative course was uneventful, her general condition not betraying the intense traumatism she suffered. The other patient had a sigmoid-uterine fistula resulting from abortive attempts five months and a half before entering the clinic; the breach was so large that the woman defecated through the vagina and a cecal anus was made by Dr. A. Gutiérrez for temporary relief; 45 c.c. of procaine solution was injected peridurally. Two months afterward the fistula was closed, although with some difficulty because of adhesions between the sigmoid colon, loops of small intestine and uterus. The operation lasted for an hour and forty minutes and 50 c.c. of solution were injected. The postoperative stage was satisfactory and a month later, the cecal anus was closed using 35 c.c. of procaine solution.

TABLE I. PERCENTAGE OF CASES IN WHICH VARIOUS FORMS OF ANESTHESIA WERE USED

Form of anesthesia	1930	1931	1932	1933
General	68.00%	67.00%	26.20%	4.01%
Local	25.60%	27.00%	35.50%	12.40%
Spinal	3.40%	4.60%	2.50%	0.24%
Miscellaneous .	3.00%	3.40%	4.46%	1.93%
Peridural			30.90%	81.20%

The results obtained with peridural anesthesia are such that, in Dr. Gutiérrez' clinic, it has practically supplanted other anesthetics (Table I).

Conclusions

It is admitted that peridural anesthesia is not perfect, inasmuch as there is some risk attached to its use, but it is equally undeniable that, so far, it seems to be superior to the method of anesthesia commonly used. It is safer than spinal anesthesia because it has all the advantages of that method and none of its disadvantages (bulbar accidents, cephalea, rachialgia, paralysis, vomiting, and so forth). It is better than anesthesia with ether or chlorofrom because it is much less toxic; it may be used in cases when ether or chloroform are contraindicated; it may be repeated without further inconvenience and the postoperative stage is excellent. Local anesthesia is less toxic, but it cannot be used for nervous high-strung patients; it requires greater anatomic skill on the part of the surgeon and a very accurate diagnosis to avoid exploratory maneuvers, and it takes much time—a serious drawback.

We believe that Pagés' peridural anesthesia represents real progress in surgery, although a definite verdict cannot as yet be passed. In the meantime, together with other surgeons in the country who have followed our example, we are gathering experience and data.

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THE TREATMENT OF PNEUMOCOCCIC MENINGITIS WITH SULFANILAMIDE AND SPECIFIC SERUM*

Report of a Case with Agranulocytosis and Recovery

ROYAL C. GRAY, M.D., Ph.D.
Minneapolis, Minnesota
and
BLAIR ADAMS, M.D.
Loveland, Colorado

PNEUMOCOCCIC meningitis may be a sequela of pneumonia, middle ear and mastoid and other skull sinus infection, or of skull fracture. It is a rare complication of lobar pneumonia. More frequently it is secondary to otitis media and sinusitis. However, it often occurs entirely independent of any other clinically detectable lesion. The onset is usually acute with high fever, prostration, leukocytosis, and spinal fluid findings such as increased pressure, cell count, and protein, indicative of severe meningeal inflammation. Pneumococci may be identified morphologically in a spinal fluid smear but the accurate and therapeutically proper diagnostic method is by culture and typing. There is no particular distribution of types except a higher frequency of Type III incident to middle ear and mastoid infection.

The mortality in pneumococcic meningitis is practically 100 per cent. In the available American and English literature there are reported less than 100 recoveries in bacteriologically proven cases of this disease. The treatment employed singly or in combination in these cases was: spinal or cisternal-spinal drainage, urotropin, optochin hydrochloride, antimeningococcus serum, sulfanilamide, antipneumococcus serum, M. & B. 693 (sulfapyridine), and no treatment at all.

Satisfactory drainage is difficult since the purulent spinal fluid is usually too thick. Methenamine has only a very questionable general antiseptic value. Optochin hydrochloride has scarcely stood the test of time in the treatment of pneumonia. Antimeningococcus serum certainly cannot be remedial in pneumococcic meningitis. Spontaneous recovery might conceivably occur in any infection but is a forlorn hope in pneumococcic meningitis.

Sulfanilamide has been used effectively in meningitis due to streptococcus hemolyticus, influenza bacillus, meningococcus, and pneumococcus. Neal and Applebaum[9] reported fourteen cases of pneumococcic meningitis treated with sulfanilamide with three recoveries (Types IV, XXIX, and XXXI). The authors called attention to the fact that sulfanilamide penetrates all tissues, is readily absorbed into the general circulation and its concentration in spinal fluid is nearly equal to that in blood a few hours after even oral administration. Three cases of pneumococcic meningitis with recovery have also been reported by Allan, Mayer and Williams.[1] Two of their cases (Types XXIV and XXIX) were treated with sulfanilamide only and one (Type XX) had also repeated spinal drainages but improvement did not appear until a radical frontal sinus operation was done to remove the focus of the infection.

Agranulocytosis may develop as a serious toxic reaction to sulfanilamide. It may be indicated by a secondary rise in temperature and therefore Long and Bliss[8] recommend detailed observation of the patient, careful temperature record, and daily blood studies. Jones and Miller[7] reported one case with recovery and noted that malignant neutropenia may develop suddenly without rash, fever, or any toxic symptom. Johnston[5] compiled from the literature twenty cases of agranulocytosis with six recoveries. The total dose in each case was from 30 to 60 grams. The duration of treatment is more significant as toxic reactions, including agranulocytosis, are more likely if treatment extends past two weeks. Of fifty ambulant patients treated with sulfanilamide by Britton and Howkins,[2] each in a total dosage of 21 grams over a fourteen-day period, 46 per cent developed transient polymorphonuclear leukopenia. The treatment usually recommended for agranulocytosis is pentnucleotide, defibrinated blood transfusions, liver extract, and forced fluids since sulfanilamide is excreted by the kidneys. The complete story of sulfanilamide and similar compounds in chemotherapy has been reviewed by Holman and Duff.[4]

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*From the Division of Nervous and Mental Diseases, University of Minnesota Medical School.

TABLE I. DETAILED SPINAL FLUID STUDIES

Hospital Day	Pressure mm. Hg.	W.B.C.	P.M.N. %	Mono. %	Protein mgm. %	Sugar mgm. %	Culture
1	22	6,800	98	2	153	89	Pneumo. IV
2	30	9,200	94	6			
3		2,800	88	12			0
4		8,000	97	3			
5		13,300	99	1			0
6		750	95	5			
7		2,800	98	2			0
8		500	100		204	66	
9		425					
10		333					0
11		245					
14	11	20	85	15	39	59	
19		35	30	70	117	69	

The treatment of pneumococcic meningitis with sulfanilamide alone or in combination with specific antipneumococcic serum is described in an excellent article by Finland, Brown and Rauh.[3] They reported ten cases so treated with six recoveries. These authors caution that highly potent specific serum in any considerable quantity intraspinally might cause a precipitation of the bacteria into clumps and thus mechanically interfere with spinal fluid circulation and drainage. They first prevent or control pneumococcic bacteremia by sulfanilamide orally and subcutaneously and specific serum intravenously. When a balance of specific antibody is thus established in the circulating blood they use the patient's own fresh serum intraspinally.

Recently a new drug, M. & B. 693, first described by Whitby,[13] has been used effectively in England and lately in this country in the treatment of pneumonia and pneumococcic meningitis. Like sulfanilamide, it is a sulfonamido compound but has one hydrogen of the sulfonamido group replaced by a basic pyridine group. It is referred to by the initials of its manufacturing chemists, May & Baker, and its serial number. It has also been termed sulfanilamide-pyridine but is now known as sulfapyridine. Whitby,[12] Reid and Dyke,[10] and Robertson[11] have reported recoveries from pneumococcic meningitis treated with M. & B. 693 (sulfapyridine). Sulfapyridine is bacteriostatic and bacteriocidal, but is capricious and sometimes will not act against a given type or strain of pneumococcus. The drug may precipitate in the kidney as acetylsulfapyridine with resultant hydronephrosis and anuria. Johnson[5,6] has noted agranulocytosis following treatment with this drug which, as with sulfanilamide, is probably due to idiosyncrasy.

Case Report

A nineteen-year-old single Scandinavian farm laborer was admitted to the University of Minnesota Hospital on May 10, 1938. His family and previous personal medical history were entirely negative. Three weeks before admission he had an apparently ordinary sore throat for two or three days and recovered completely. At noon on May 9, when he came in from his usual work in the field he complained of general malaise, chilly sensations, and a severe generalized headache. He had no appetite and went to bed. He seemed sound asleep at supper time and was not disturbed. At breakfast he could hardly be aroused and was forthwith brought to the hospital.

The patient was well developed and well nourished but obviously acutely ill. He was semi-comatose, irrational, restless, and very resistive to examination. The temperature was 102.2 F., pulse rate 100, respirations 22, and blood pressure 130/90. The skin was hot and dry and the face flushed. There was moderate injection of the conjunctivæ and a degree of catarrhal inflammation of both eardrums commensurate with any intracranial infection, but no evidence of suppuration in either middle ear cavity or any skull sinus. Heart, lungs, and abdomen were negative. The bladder was distended with urine. Neurological examination revealed bilateral positive Kernig sign, neck rigidity, slight blurring of both optic discs, and bilateral horizontal nystagmus. The deep reflexes were equal and active and the balance of the examination, in so far as it was possible, was negative. Roentgenograms of the skull and chest were negative.

A blood study was as follows: hemoglobin 77 per cent; red cells 3,500,000; white cells 9100, with neutrophiles 80 per cent and lymphocytes 20 per cent. The blood non-protein nitrogen was 43 mgm. per cent and the sugar 146 mgm. per cent. Urinalysis was negative except for a faint trace of albumen and three plus sugar. Urinalyses were negative throughout on all subsequent examinations.

A lumbar puncture was done one-half hour after admission. The fluid was cloudy, under a pressure of 22 mm. of mercury, and contained 6800 white cells of which 98 per cent were neutrophiles. The total protein was 153 mgm. per cent and the sugar 89 mgm. per cent. The Wassermann reaction and colloidal gold curve were negative. A smear of the spinal fluid revealed no organisms but a culture on blood agar showed a pure strain of pneumococcus Type IV by the Neufeld method of typing.

Treatment with sulfanilamide in a dosage of 80 grains daily in four divided doses was promptly instituted on May 10, the day of admission. The first dose was given with a feeding by stomach tube, the second in a hypodermoclysis, and all subsequent doses orally together with an equal amount of sodium bicarbonate. On May 11, Type IV antipneumococcus rabbit serum was obtained and during that and the next five days the patient received a total of 420,000 units of this serum. The first two doses, each 20,000 units intravenously and 20,000 units intraspinally, were given at two hour intervals. A third single dose of 20,000 units intraspinally was given two hours later. Since the blood culture taken on admission was sterile after eighteen hours incubation, the serum thereafter was given only intraspinally in doses of 40,000 units twice daily for three days and once daily for the next two days. The serum was then discontinued and daily spinal drainages were done until the eleventh hospital day and again on the fourteenth hospital day when the temperature and spinal fluid findings were practically normal. Detailed spinal fluid studies are shown in Table I. After three days of sulfanilamide therapy, 80 grains daily, the blood concentration of the drug was only 3.0 mgm. per cent and therefore the dosage was increased to 100 grains daily. Two days later the level was 5.3 mgm. per cent, well below the therapeutic blood level of 10 mgm. per cent, but since the patient was then vomiting the drug was discontinued for that one day. It was resumed, at 80 grains daily for the following week, then decreased to 40 grains daily for four days, and finally discontinued on the nineteenth hospital day. The essential details of the patient's temperature, pulse rate, therapy, and blood leukocyte counts are shown graphically in Figure 1.

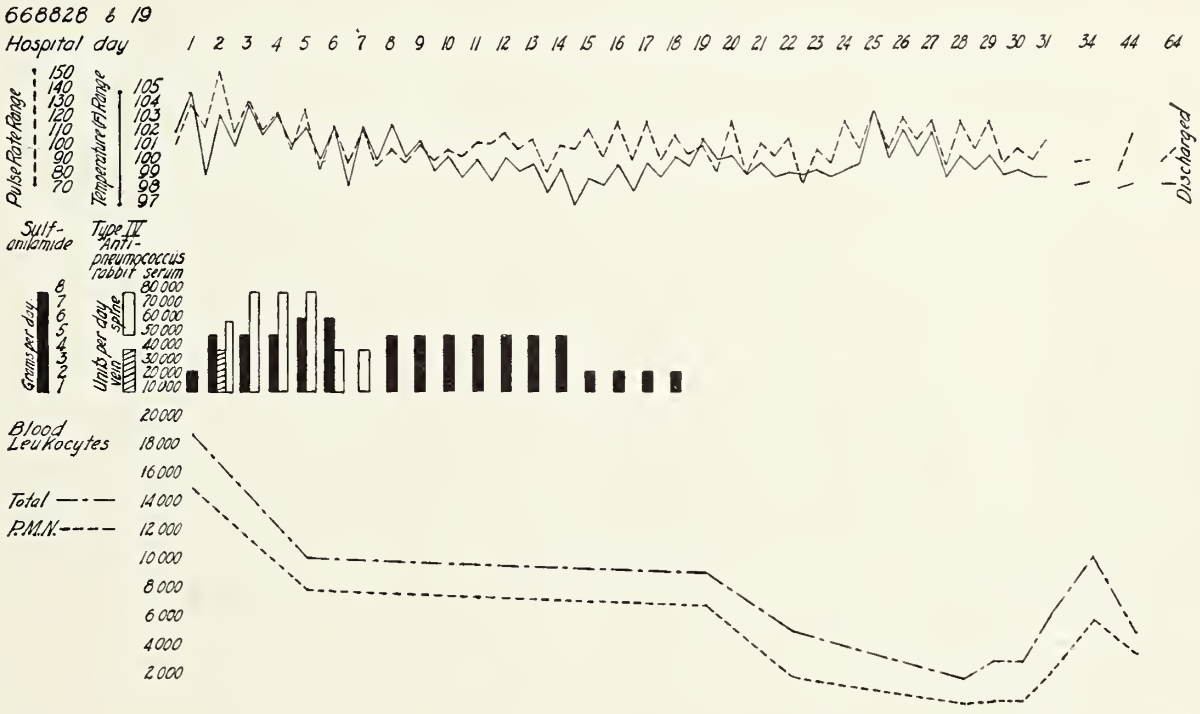

Fig. 1. Graph showing range of temperature and pulse, sulfanilamide and serum therapy, and blood leukocyte counts.

On May 19, the following neurological changes were noted: the pupils unequal with the left larger than the right, the right biceps reflex absent, and the left knee jerk diminished. Neck and back rigidity were still present but to a much less degree. The nystagmus had disappeared.

The patient required catheterization during the first twelve hospital days. On the twelfth and thirteenth days he was given pilocarpine, grains 1/10, four times daily. He had no difficulty in voiding after the first two doses of this drug. As soon as he became rational, at the beginning of the second week, it was noted that he had a profound bilateral nerve deafness. There was a total loss of hearing in the left ear and hearing for conversational voice in the right ear at one foot. The C512 tuning fork produced no sensation when placed on either mastoid process.

Progress of the illness otherwise seemed uneventful with gradual recession of the fever, disappearance of the neurological findings, and clinical improvement of the patient. On May 28, the nineteenth hospital day, a rise in temperature to 101.8 F. was noted. There were no unusual symptoms and the blood leukocyte count that day was 9500 with a normal differential. The fever rise was for that one day only, progressively declined the following days and on the twenty-second hospital day it was down to 99.4 F. However, the leukocyte count that day was 5250 with 40 per cent neutrophiles, 48 per cent lymphocytes, and 12 per cent basophiles. A malignant leukopenia (agranulocytosis) was more definitely shown in the leukocyte and differ-

TABLE II. DETAILED BLOOD STUDIES

Hospital Day	Hgb. %	R.B.C.	W.B.C.	P.M.N. %	Lympho. %	Mono. %	Eosino. %	Morphology
1	77		19,100	80	20			
5	70	5,000,000	10,500	78	22			
7	75	3,500,000						
9	70	3,200,000						
19			9,500	75	23	1	1	
22	73	3,700,000	5,250	40	48			Basophiles 12%
28	80		2,000	13	70	6	11	
29			3,200	13	73	5	9	Toxic P.M.N.s
30			3,200	13	66	9	12	Few myelocytes
31			6,500	37	56	3	4	Few stab cells
34			10,600	57	38	4	1	leukocytoid and
44	72		5,100	73	25	2		monocytoid lymphs
59	75	3,670,000						

ential counts on the twenty-eighth day. No treatment was instituted for the agranulocytosis from which the patient made a spontaneous recovery by the thirty-fourth day when the leukocyte and differential counts were nearly normal. Detailed blood studies are shown in Table II.

An added complication appeared on the twenty-fifth hospital day when there was a sharp rise in temperature to 103.6 F. with evidence of pharyngitis, cervical adenitis, and left otitis media. A left myringotomy was performed and staphylococcus albus was cultured from the pus obtained from the middle ear. Recovery from this infection was prompt, the patient's temperature on the thirty-fourth hospital day was normal and remained so throughout the remainder of his total hospital stay of sixty-four days.

On June 20, when he first attempted to walk, his sense of equilibrium was found to be almost entirely lost. Caloric tests showed no response from either labyrinth. This, together with the deafness, indicated practically a complete destruction of both eighth cranial nerves. When he left the hospital on July 12 he had learned to walk fairly well by watching his gait carefully but he was still almost totally deaf. Otherwise he had made a full recovery from his illness.

The patient has been seen several times since then, the last time on December 7, 1938. Audiograms then showed slight increase in hearing acuity by air conduction for low tones in the right ear but still a total loss in the left ear. Bone conduction showed only a minimal residual for low tones in both ears. He had learned to compensate for the ataxia by vision and had acquired some skill in lip reading. Except for the only neurological sequela of the bilateral eighth cranial nerve involvement he was in excellent health.

Comment

Since both sulfanilamide and specific serum were used in this case the efficacy of either one alone could not be determined. Spinal drainages were done daily just preceding each intraspinal serum injection and for four days after serum was discontinued. The drainages were likely a helpful therapeutic adjunct but no more than that. Eradicating a focus of pneumococcic infection, had there been one present, would have been of more value. The total amount of serum given was about twice that which is now considered sufficient; at the time this patient was treated there was no established therapeutic limit. The agranulocytosis was due to toxicity or idiosyncrasy to sulfanilamide, since the patient had nausea and vomiting when the blood level of the drug was only 5.3 mgm. per cent and had a secondary rise in temperature four days before the white blood cell changes were noted. Although the patient was catheterized twenty-five times the urine was regularly negative, probably due to the antiseptic action of the sulfanilamide. Deafness is often a sequela of meningitis but the added involvement of the vestibular branch of both eighth cranial nerves is very unusual.

Summary

1. A bacteriologically proven case of pneumococcic meningitis with recovery is reported.

2. The case was complicated by agranulocytosis and otitis media and had the unusual residual of complete bilateral eighth cranial nerve involvement.

3. Treatment was with sulfanilamide, specific antipneumococcus rabbit serum, and repeated spinal drainage.

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IDIOPATHIC BENIGN HYPERTROPHIC PYLORIC STENOSIS IN THE ADULT

FRANCIS E. KIBLER, M.D.
Austin, Minnesota

IN 1788, H. Beardsley of Connecticut recognized pyloric hypertrophy at an autopsy performed on a five-year-old girl.

Hypertrophic pyloric stenosis in adults was first recognized in 1835 by Jean Cruveilhier, who described and illustrated this condition in a volume of "Pathological Anatomy of the Human Body" published in Paris. His treatise was complemented by the presentation of two personally treated cases. J. Boas in 1898, reported two cases of hypertrophy of the pyloric muscle which had been positively diagnosed clinically and later confirmed at the operating table. He believed that the hypertrophy was secondary to inflammation and argued for "stenosing gastritis" as the etiological factor.

Incidence

Pyloric stenosis in the adult has been generally conceded to be quite uncommon. However, according to several writers, this condition is of much more frequent occurrence than is ordinarily believed. According to R. Rossle,[21] specific examination in over 5,000 autopsies performed in Berlin and Basle, revealed that 3 per cent of adults were so afflicted, even with the extreme forms, and that from past histories, very few were known to have had associated symptoms during life. The discrepancy between the incidence and the clinical recognition of the disease is probably explained on the basis of a failure to recognize the symptoms per se, or to confuse them with the symptoms of a concomitant chronic gastritis, ulcer or biliary disease.

The manifestations of this lesion appear most commonly between the ages of twenty and forty, and occur more frequently in females than in males in a ratio of about one and one-half to one, and are observed more frequently in members of the Latin race rather than in the Anglo-Saxon. All authors agree, however, that an inherited predisposition is necessary for the development of this disease.

Etiology

In reviewing the literature for the etiological concepts of this condition one is depressed by the multiplicity of the theories and staunch arguments presented for each, as to whether the hypertrophy is primary in the muscularis with secondary changes in the mucosa and submucosa, or vice versa; or whether the adult form is simply a carry-over of the infantile condition with late manifestations, or a separate and distinct lesion developing in adult life.

Morton[18] and Deaver[7] believe that a type of obstruction similar in all respects to the congenital form may arise from spasm of the pylorus. Conversely A. James Walton[26] maintains that the presence of great muscular hypertrophy indicates the presence of a congenital pyloric stenosis, in that evidence is lacking that hypertrophy will follow pylorospasm.

McClure,[16] in reporting five cases pathologically similar to congenital pyloric stenosis, but occurring in adults, states that: "It is probable that these are all mild examples of the congenital disease, in which the obstruction has been overcome by hypertrophy of the gastric muscle and it is only later in life that compensation fails and symptoms become manifest."

Bassler[3] states that chronic alcoholism is a prominent factor in most cases, and that hypertrophic gastritis, with a subchlorhydric, achlorhydric or achylic condition, is always present and may be the primary factor.

Donati[8] maintains that both congenital and acquired factors, especially those relating to the production of pyloric spasm, are involved in the pathogenesis.

H. Knauer[14] very aptly writes that two different terms for the same or at least extremely similar disease entities indicate that the etiology has not been completely explained. Some apply the term hypertrophic pylorostenosis, assuming an abnormal narrowness of the mucosa (primary stenosis) followed by a secondary muscular hypertrophy, others adhering to pylorospasm as producing a "primary" tumor-like muscular hypertrophy. He believes that the various factors concur to produce what he designated as "pylorospasm in simultaneous hypertrophic pylorostenosis."

McNamee[17] suggests the term "idiopathic pyloric stenosis," to which the writer would include benign hypertrophic, thus giving a term that is descriptive from both the pathological and clinical aspects, and at the same time non-controversial from the etiologic viewpoint.

Lerck-Hanssen,[17] of Finland, concludes that the hypertrophy is the result of a chronic gastritis and prepyloric ulcer since one or both were always present in his cases of hypertrophic stenosis. These findings have been repeatedly borne out by American, German, English and French pathologists. Because of these associated antral and prepyloric inflammatory changes, the evidence favors the opinion that inflammation (chronic hypertrophic gastritis) is the most important single factor in the production of benign hypertrophy of the pylorus, relegating the congenital theory to a secondary position. Quoting Ross Golden[10]: "However, the foundation for the development of hypertrophic changes under proper stimuli must be considered from the viewpoint of a 'congenital predisposition.' "

In conclusion, the various theories may be summarized in the order of their respective merits:

1. Mixed theory: dependent upon two or more of the above mentioned concepts.
2. Congenital predisposition: latent in character and manifesting itself on activation by nervous stress and strain, or inflammation (local or general), or progressive debility and the like.
3. Acquired: secondary to ulcer, gastritis, syphilis or tuberculosis, local evidences of which have disappeared.
4. Carry-over or continuation of the congenital stenosis of infancy.
5. Hypertrophying pylorospasm: dependent upon a prolonged hyperirritability of the parasympathetic nervous system with concomitant compensatory changes in the stomach, symptoms becoming increasingly manifest as compensation fails due to disruption of the viscero-visceral reflex of the component branches of the autonomic nervous system.
6. Neoplastic: the hypertrophy in reality a benign growth-myoma or fibromyoma.

Pathology

Cunha,[6] using the term idiopathic benign hypertrophic pyloritis, maintains that the condition is not a simple acute or chronic inflammatory gastritis with the associated mucosal changes usually found, but rather a distinct clinical entity with a characteristic pattern limited to the pylorus, the most outstanding feature being a hypertrophy of the mucosa and submucosa with secondary edema and hypertrophy of the muscularis. The intense thickening of the mucosal layer with concomitant enlargement of the folds causes obstruction by encroaching on the pyloric canal. Secondary changes, including stasis, may be moderate or extreme. At autopsy, the true nature of the lesion is frequently modified, due to rapid diminution of the edema following death.

According to Savarese,[22] the condition is "a special alteration of the pylorus characterized by a thickening of this portion of the stomach due to hypertrophy of the muscular tunic and without participation of the other layers." Thus by definition, the muscular hypertrophy is sharply distinguished from pyloric hypertrophy due to lesions primarily of different anatomical substrates, such as: simple inflammation, lues, tuberculous and neoplastic growths and peptic ulcers of the mucosa and submucosa.

Eustermann and Balfour[9] define true pyloric hypertrophy as: "an enlargement or overgrowth of the pyloric muscle, without an apparent causative or associated lesion." They are convinced that primary muscular hypertrophy with the anatomical changes simulating the infantile type is uncommon, whereas the adult form is associated most frequently with duodenal, gastric or cholecystic disease, such as: peptic ulcer, gastritis and chronic cholecystitis.

Gross examination reveals a smooth circular or fusiform swelling completely encircling the pylorus. The consistency of the tumefaction varies from that of normal liver to the non-resilient firmness of cartilage. The tumor is usually sharply demarcated, but this is dependent upon the degree of associated secondary thickening and dilatation of the stomach wall. However, the duodenal extremity is always sharply differentiated, since the obstruction is at the proximal extremity. The tumor is freely movable through the normal range of pyloric mobility in the absence of a primary or secondary peri- or para-duodenal lesion. Fixation of any degree would immediately indicate underlying pathology of either the stomach, duodenum, gallbladder or pancreas. The cut surface reveals a variable thickening of the pyloric wall, chiefly of the muscular tunic, which is pale red in color and of a more fibrous consistency than normal muscle. The mucosa and submucosa strata are likewise thickened and edematous. The lesion specifically involves the entire length of the pyloric canal and is sharply confined to its borders, the caliber of the canal being determined largely by the degree of the hypertrophy of the circular (inner) muscular layer, while complete obstruction is dependent upon prolapse of the edematous or hypertrophic prepyloric gastric mucosa, or simple edema with or without hypertrophy of the pyloric mucosa itself.

Microscopic examination is essentially that of simple hypertrophy of the circular layer of the muscular tunic and to a less extent of the mucosa and submucosa. The muscle cells are of normal form and arrangement but increased in size—a true hypertrophy. No changes are present in the connective tissue stroma, serous or subserous layers. Occasionally there may be found a lymphocytic infiltration of the mucosa, which at times extends into the muscularis mucosa and submucosa.

According to Judd and Thompson,[12] hyperplasia is also associated with the hypertrophy, and occasionally hyperplasia, atrophy or inflammation of the other layers of the pylorus is present, including the peritoneal covering. Savarese[22] firmly believes that it is impossible, by both gross and microscopic examination, to differentiate between a true muscular hypertrophic stenosis and a pyloric hypertrophy associated with inflammatory changes, quoting: "distinction is dependent upon causal and evolutive differences of a process which is essentially the same in every case."

Symptoms

The symptoms of idiopathic benign hypertrophic pyloric stenosis are from early life multiple and variable, vague in character, with exacerbations precipitated by any intercurrent infection, patients obtaining at best only temporary relief from antispasmodics and various diets. As a result they wander from one doctor or clinic to another in search of aid, in the course of which they are subjected to many x-ray studies and other laboratory procedures, each doctor expecting to find an ulcer or neoplasm. In absence of either of these they are informed that they have "nervous indigestion" and earmarked as neurotic. However, with the onset of mechanical obstruction, a group of symptoms predominate the picture and mask those of the underlying cause or causes. Thus the true nature of the obstruction can be learned only by thorough investigation of the past history. Even then the internist and surgeon are very frequently baffled, not only as to etiology, but with regards to the diagnosis itself.

The usual clinical course is a syndrome of chronic intermittent, progressive, and finally continuous gastric dyspepsia occurring most frequently in young asthenic adults of the so-called high-tension type. Early, the symptoms may vary from time to time so as to mislead the clinician. Chronic pylorospasm is a frequent diagnosis, explained on basis of reflex irritation from a "chronic appendix," gallbladder, or colitis. In these cases an appendectomy gives only temporary, if any, alleviation of symptoms. Duodenal ulcer or duodenitis may be simulated, in that pain and discomfort appear within a few hours of eating, and in not a few, relief is obtained by ingestion of food, alkalies, or by vomiting.

As the obstruction manifests itself, the periodicity is lost and the attacks are longer and finally merge one into the other. In the primary or idiopathic form, the symptoms are of long duration, frequently traced back to childhood and characterized by remissions and exacerbations; whereas, in the presence of a stenosing ulcer the intervals of relief, though not as long as in the idiopathic form, will be much more prolonged than that in carcinomatous obstruction.

Pain.—The subjective symptom of pain is due partly to the mechanical obstruction itself and partly to the associated secondary gastritis, with the result that the pain is continuous with exacerbations from ingestion of food or water. As the stomach dilates, losing its normal tubular form, the pain appears immediately after ingestion of food instead of after an interval as in pyloric ulcer. The pain at first is not severe, but is more a sensation of fulness and discomfort which steadily increases with time and as the stomach capacity increases. In addition to the constant dull aching pain, due to dilatation, there are waves of a more severe crampy nature, due apparently to peristaltic action.

Vomiting.—The truly characteristic vomiting is that of large quantities at long intervals. The longer the condition has existed the more tolerant the stomach becomes of its contents and the greater the retention before emesis appears.

Hematemesis and Melena.—In the presence of idiopathic muscular hypertrophy, fibrosing ulcers, and scirrhous neoplasms, loss of blood is unusual, although small quantities may be discovered by chemical analysis. However, with fungating growths, brisk hemorrhages may occur from time to time.

Appetite.—Anoxeria due to gastritis is the rule. However, in the early stages, the relief from distress when the stomach has been emptied, produces a desire for food. Thus one must remember that a good appetite does not exclude the possibility of pyloric obstruction.

Loss of Weight.—Wasting is nearly always present, partly on the basis of the secondary gastritis and partly due to the fact that so little food ever reaches the intestine for digestion and absorption. As a result, the physiology of the large and small bowel is upset and constipation of a severe grade is a prominent complaint.

Physical Examination

Evident wasting is present in all patients, the degree of which is dependent upon the length of time that the obstruction has existed. Sometimes the cachexia is more marked in the benign than in the malignant type of stenosis.

The lower abdomen is retracted while the epigastrium is full from the presence of a distended stomach.

Tenderness to deep palpation, with or without a wide area of hyperesthesia over the epigastrium and left half of abdomen is generally present. A succussion splash may be elicited over the distended stomach, provided the hypertrophy of the gastric wall is not excessive, and simple percussion permits fairly accurate outline of the viscus. Occasionally a hypertonic stomach is present and the contracted organ is palpable. In the presence of marked gastric hypertrophy, peristaltic waves may be seen moving from left to right and are accompanied with complaints of pain, followed by emesis of small amounts of mucus and the normal yellowish watery gastric secretion when food has not been taken. Percussing or palpating the abdomen, or having the patient drink a small amount of water will precipitate peristaltic action. Sometimes (variously reported to occur in from 50 to 75 per cent of the cases) a definite tumor may be felt in the region of the pylorus. If benign in nature, the mass is somewhat rounded, firm but not hard, movable and smooth in outline; whereas, a malignant growth is hard, irregular, fixed and less well defined. Confirmatory evidence of the latter may frequently be found by palpation of metastatic growths along the liver border or in the pelvic cul-de-sac.

Pathognomonic symptoms of pyloric obstruction are:

1. Visible peristalsis
2. Pain followed by projectile vomiting.
3. Evidence of retained and fermented food
4. Succussion splash
5. Palpable tumor mass
6. Absence of blood in vomitus and stool
7. Absence of bile in vomitus

Diagnosis and Differential Diagnosis

The diagnosis of idiopathic benign hypertrophic pyloric stenosis may be relatively easy, but in the majority of instances, the diagnostic acumen of the clinician and surgeon are sorely taxed. According to Toupet and Mouchet,[23] this is impossible even in the operating room. They maintain: "that whatever the clinical picture may be or whatever the appearance of the condition at operation, it is impossible to eliminate the possibility of cancerous infiltration until microscopic examination is made."

A history of long-standing vague gastric dyspepsia, progressive in nature, and characterized by a progressive syndrome of episodic pain, vomiting, retching, loss of weight and constipation, in which the remissions become less frequent and of shorter duration, with each exacerbation becoming more intense and prolonged, should suggest the possibility of this condition.

The differential diagnosis is at all times difficult and not infrequently impossible. However, a careful history and thorough physical examination complemented with adequate laboratory procedures, will in most cases allow the clinician to reach a definite diagnosis.

The most commonly confounded conditions are:

1. *Gastric and Duodenal Ulcer.*—Any chronic ulcer near the pylorus tends toward stenosis. Usually the ulcer is of long standing and thus the patients are frequently past fifty years of age. The actual narrowing is due to a dense fibrosis spreading from the ulcer and surrounding the canal. In others, a penetrating ulcer that becomes adherent to the gallbladder, liver or pancreas, may, by the associated inflammatory reaction and edema, help in narrowing the lumen. Adhesions following this type of condition may, on contraction, draw upwards and kink the pylorus. The stomach usually shows a secondary hypertrophy and dilatation, and gastritis is usual from the concomitant stagnation.

2. *Pyloric Spasm and Simple Fibrosis.*—Pyloric spasm secondary to, and associated with, disturbed physiology or actual pathological changes in the gallbladder, appendix, colon and kidneys, is well known and demonstrable through x-ray and fluoroscopic examination. Walton[27] and Oliver[19] seriously doubt that pylorospasm is capable of producing hypertrophy of either the pylorus or of the gastric wall; such changes should be regarded as definite evidence of an organic lesion in the pylorus. McClure[16] suggests the use of atropine sulphate hypodermically to rule out pylorospasm. Under the fluoroscope the effects of relaxation of the hypertonic muscle is readily visible, and if hypertrophy of the muscle is actual, complete disappearance of the constriction will not occur.

Simple primary fibrosis of the pylorus is a doubtful entity. Most investigators are of the opinion that an ulcer or gastritis is the primary lesion.

3. *Gastric Tumors.*—Any neoplasm at or near the pylorus may lead to obstruction by infiltration of the walls with or without projection into the lumen. Scirrhous carcinoma and a reactive fibrosis may cause a narrowing of the canal identical to that scarring resulting from a gastric ulcer. Usually, however, this thickening and narrowing involves a greater area. A polypoid growth may cause an intermittent type of obstruction through a ball-valve mechanism. Complete obstruction has been reported, wherein the tumor was drawn through the pyloric ring, resulting in an intussusception of the stomach.

4. *Paragastric and Paraduodenal Inflammation.*—Chronic inflammatory changes about the pylorus may result in a secondary constriction. The commonest causes of this phenomenon are cholecystitis and pancreatitis.

5. *Paragastric Carcinoma.*—Carcinoma of the gallbladder, hepatic or transverse portions of the colon, and head of the pancreas may narrow and obstruct the pylorus by compression, actual infiltration, or as the result of the inflammatory reaction.

6. *Kinking of the Pylorus and Duodenum.*—Temporary acute obstruction due to kinking is most common in the presence of a ptotic and mobile stomach. Similarly a ptotic and mobile kidney may draw the duodenum downwards and cause kinking and obstruction, giving rise to one of the varieties of Dietl's crisis. The obstruction generally being acute and temporary in nature, is not followed by hypertrophy of the stomach walls and visible peristalsis. The symptoms occur when the patient is upright and are relieved almost immediately, or, at least, ameliorated by reclining.

7. *Unusual conditions* that have been reported are merely listed:

(a) Duodenal compression by the superior mesenteric or middle colic arteries in the presence of an exceedingly short mesocolon. Symptoms are present when colon is full.

(b) Congenital bands—the so-called "primary periduodenal adhesions."

(c) Calcified retroperitoneal lymph nodes.

Chronic duodenal obstructions do not produce muscular hypertrophy of the pylorus. Symptoms of an aching epigastric distress with nausea and occasionally emesis, occurring soon after eating and exaggerated by standing or sitting, and relieved by lying prone are pathognomonic of duodenal obstruction. Fluoroscopic examination reveals a dilated duodenum with stasis, exaggerated peristalsis and antiperistalsis. In all cases, regurgitation of the barium into the stomach through a patent pylorus immediately rules out the presence of a pyloric lesion.

Laboratory Procedures

Urinalysis.—There may be a high specific gravity resulting from dehydration.

Blood.—In the presence of a dehydration the hemoglobin, red and white blood cell counts are elevated. A leukocytosis would be, of course, only relative, and the differential count normal in the absence of a coexisting infection. However, an actual leukocytosis is present in severe dehydration.

Sedimentation Rate.—This is not increased.

Blood Wassermann.—The test should be made to rule out neuro- and viscero-syphilis.

Gastric Analysis.—Free hydrochloric acid may be diminished or absent due to the associated gastritis. Free acid will more likely be absent if the obstruction is malignant. Total acidity is increased owing to retention fermentation. Bile salts and blood are absent in the benign type of obstruction. Fractional analysis will show an increase of total acid and retention of starch in all specimens.

Roentgenologic Examination.—The fluoroscopic examination is the most important single procedure in the diagnosis of pyloric obstruction next to the taking of a detailed history. "Spot" roentgenograms are useful for a permanent record of the case. Routine gastric x-rays as taken by the technician are useless.

Numerous "signs" have been discovered and pronounced by their authors to be pathognomonic for idiopathic benign hypertrophic pyloric stenosis. However, these have not been infallible in many cases, even in the hands of their particular exponents; but nevertheless they have aided in advancing roentgenologic diagnosis of diseases of the stomach and duodenum.

Typical findings show varying degrees of pyloric obstruction with dilatation of the stomach, strong and frequent peristaltic waves, and retention of the motor meal. Peristalsis will appear at varying intervals and may result in esophageal regurgitation.

It is generally conceded that a concentric pyloric defect with an elongated narrow canal and intact mucosal relief establishes the diagnosis.

Golden[10] believes that the demonstration of mucosal folds in the involved area is the most important differential point from the roentgenologist's viewpoint. Hypertrophic changes in the mucosa, even in the presence of marked muscle hypertrophy, are easily discernible, whereas carcinomatous infiltration obliterates these folds. In some cases only one wall may be infiltrated and thus cause confusion. Regressive obliteration of the folds may again serve to cloud the issue.

According to Kirklin and Harris[13]: "Concentric indentation of the bulbar base in conjunction with prepyloric narrowing is pathognomonic of pyloric hypertrophy." The base of the normal bulb is flat; the concavity or indentation is believed to be produced by a partial invagination of the hypertrophied muscle into the bulb.

The presence of a patent pylorus indicates a duodenal obstruction. A long irregular canal, with or without filling defects, suggests carcinoma. A well defined defect, niche, or crater indicates ulcer. Very frequently the barium is unable to pass the pyloric ring and enter the canal, and although an obstruction to the stomach outlet is thus evident, the true nature cannot be determined. When this is present, as mentioned previously, atropine administered by injection is invaluable in differentiating between pylorospasm and an organic lesion, as the cause of the obstruction.

Treatment

In the light of our present-day concepts regarding the true cause and nature of the disease, and the reasonable doubt necessarily associated with the clinical diagnosis thereof, surgery offers the only hope for cure.

Bennett[5] maintains that medical treatment of pyloric stenosis fails in the majority of cases because it fails to meet the requirements and habits of the individual patient. Quoting: "There is no other disease in which the personal factor is of more importance. It is a mistake to assume that organic narrowing of the pyloric canal, even of high degree, must in all cases be treated surgically." The principal gastric function is to secure liquefaction of food; by which is not meant solution, but a chyme with the consistency of a weak gruel. Therefore, food requiring prolonged gastric digestion must be avoided and a diet with the consistency of chyme substituted. Bennett feels that a regimen as outlined below, plus indicated medicines pushed to the point of saturation or tolerance of each individual patient so as to secure gastric rest, will promote permanent healing and return of health. He advises: gastric lavage in the presence of emesis, dextrose lemonade for from one to two days, followed by diluted milky foods and progressing to a semi-fluid diet for several weeks.

The surgical treatment is undertaken for the purpose of: (1) establishing a definite diagnosis; (2) relieving permanently the obstruction by the simplest, yet adequate, method deemed advisable for that particular case; (3) reëstablishing the normal motor and secretory functions of the gastrointestinal tract.

Preoperative and postoperative treatment is of paramount importance, the fundamentals of which are well known. The details alone vary, and are dependent upon the individual surgeon's pet ideas. However, with regards to anesthesia, ether is still considered by the majority of surgeons to be the best and safest anesthetic, and that it should be administered by the open drop method.

In 1912 Rammstedt introduced his well-known operation, which consisted of incising the serosa and muscularis down to the mucosa and spreading to allow the mucosa to gape through the hernia. Since then several modifications have been introduced. Early surgeons performed gastroenterostomy almost exclusively, but since 1912 a pyloroplasty of some form has been the preferred procedure.

The operations that the various surgeons consulted have used in the treatment of this condition are listed below:

1. Pylorodiosis—by Loreta's technic (dilatation through gastrotomy wound) or Hahn's method through the unopened stomach.
2. Pylorodiosis by the Rammstedt technic and its modifications.
3. Nicol pyloroplasty with or without gastrotomy.
4. Finney's operation—lateral or pyloric gastro-duodenostomy.
5. Heineke-Mikulicz pyloroplasty.
6. Hemi-resection of anterior portion of pylorus.
7. Posterior gastroenterostomy.
8. Resection of pylorus followed by Polya or Billroth II anastomosis.
9. Gastropylorectomy.

The last two procedures are advocated by the continental surgeons, who base their choice of operation on the claims that only the microscopic examination can rule out the presence of malignancy, and therefore, any procedure that does not allow for this possibility is inadequate.

However, the Rammstedt pylorodiosis and the simpler pyloroplastic technics have stood the test of time and have shown just as great a percentage of cures and certainly a much lower morbidity and mortality rate than have the more extensive procedures. However, the operative results of the Rammstedt operation can be satisfactory only if the entire circular muscle is divided, wide separation and retraction of the divided muscle being entirely of secondary importance. Timely operative interference remains, none the less, the most important prerequisite.

Case Report

A white female, thirty-six years of age, was seen complaining of abdominal distress of eighteen years' duration.

Following an operation for strangulated incisional hernia in 1920, the patient has suffered from episodes of gaseous distention, pyrosis, nausea and abdominal distention lasting from three to four days and occurring at intervals of from four to six weeks, at first relieved by gastric lavage or vomiting.

For the past nine years the symptoms have gradually progressed, with remissions of shorter duration so that at present these "spells" occur every ten to fourteen days, with emesis and pain the predominant symptoms. The pain in the epigastrium radiates to the left side and back and vomitus at first contains undigested food and later only mucus and yellow fluid. During the height of the attack the pain and retching are simultaneous and occur without preceding nausea. Bile or blood had never been observed in the vomitus.

She complains of hunger and thirst but has been afraid to eat for fear of precipitating pain and emesis. During this time the patient has been under the care of one clinic and had undergone many and varied examinations. A diagnosis of pyonephrosis was made in May, 1936, and was followed by a right nephrectomy.

Following this she was entirely free of symptoms for about six months, then they recurred in more severe form. At this time she underwent another operation to relieve a "twisted intestine." However, the postoperative course was complicated by epigastric distention, pain and vomiting. Following her discharge from the hospital, examinations failed to locate any cause for her symptoms, and she was finally told that she was "neurotic" and referred to a neurologist and discharged.

The patient was first seen in June, 1938, complaining of pain, vomiting and abdominal distention recurring at intervals of from two to six days. Associated with these symptoms were complaints of frequency, burning pain on urination, nocturia and left lumbar pain.

Examination revealed a well developed but undernourished emotionally unstable adult white female. Gaseous eructations were frequent during the examination. Her face and neck were flushed; the tongue, lips and skin dry. The abdomen was full but not tensely distended; there were no palpable masses, visceræ or herniæ noted. Peristaltic waves were not observed and there was no free fluid demonstrable in the abdomen. Borborygmi were present over the entire abdomen, more pronounced in the right lower quadrant. Tenderness was elicited on palpation of the upper half of the low midline scar, and also on light Murphy percussion of the left flank. There were healed lower midline, right mid-transrectus and right lumbar incisional scars.

The patient's temperature was 99°, pulse 88, blood pressure 160/100. Urinalysis was normal save for an occasional red blood cell.

The tentative diagnoses were: (1) chronic high intestinal obstruction; (2) essential hypertension; (3) possible left upper urinary tract lesion.

In view of her past history, a urologic study was deemed advisable before considering abdominal section. Cystoscopic examination followed by retrograde pyelography (left), excretion urography, and renal function tests were negative except for absence of the right kidney. However, the x-ray films showed several loops of ileum and stomach distended with gas.

The following day the patient felt considerably improved and asked to be released for a few days before submitting to operation. She was readmitted to the hospital on July 10, 1938, acutely ill and complaining of constipation, abdominal pain and distention, repeated emesis and retching, of twelve hours' duration. Her temperature at this time was 98°, pulse 100, blood pressure 122/84, urinalysis negative and white blood count 11,650.

Continuous gastric siphonage was instituted and parenteral fluids administered. Retching continued, finally becoming almost continuous after a period of six hours, in spite of siphonage. At this time visible peristaltic waves were observed in the epigastrium, traveling from left to right. The entire abdomen was tympanitic to percussion, generally tender, but more so over the upper half. No masses were palpable. Borborygmi were general over the entire abdomen, and a high-pitched whistling sound was heard just below and to the left of the umbilicus.

Flatus was passed occasionally and colon flushing only added to the patient's distress. The temperature rose to 100° and pulse rate gradually increased.

A diagnosis of acute and chronic intestinal obstruction with associated duodenal obstruction was followed by an exploratory laparotomy. The abdomen was opened through the old right transrectus scar, and exploration revealed an incomplete obstruction of the ileum about five feet above the ileo-cecal juncture, due to an incarcerated Richter's hernia at the upper angle of the old midline incisional scar. This was reduced and the hernia repaired by the intra-abdominal approach, and the intestinal pouch invaginated. The stomach was distended with gas, the walls thickened and edematous, and the pylorus completely obstructed by a typical circulaur muscle hypertrophy. This was relieved by the Rammstedt method and the incision covered by the transverse approximation of the serosa. The small bowel distention, in the meantime, had decreased considerably and flatus and liquid stool was escaping from the rectal tube.

The postoperative course was extremely uneventful. Oral fluids were taken as soon as the patient recovered from the anesthetic, and food was allowed the following morning. The patient was discharged, as improved, on the twelfth postoperative day. Subsequent office examinations have confirmed complete recovery. In a letter received in December, 1938, the patient states that for the first time in nine years she has been completely free of abdominal distress and is able to eat any and all varieties of food with impunity.

This case has been presented since it rather fully reiterates the points previously reviewed. In addition, the associated Richter's hernia and partial intestinal obstruction added to the confusion of an already difficult diagnostic problem. The question of x-ray investigation of the stomach and duodenum has no doubt already been raised. This examination had been performed, and found negative, by a competent radiologist within a period of three months prior to her first visit at this clinic; and in addition, such an examination was impossible at the time of her second admission, due to the almost continuous vomiting, even in the presence of an automatic gastric suction apparatus.

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PSORIASIS*

A Clinical and Laboratory Statistical Study

JOHN F. MADDEN, M.D.
Saint Paul, Minnesota

PSORIASIS is one of the more common skin diseases. However, very little is known about it except its clinical appearance and histopathology. This statistical study helps to evaluate certain allegations regarding psoriasis and shows some facts concerning the disease. There were forty-four cases examined. Of this number twenty-eight were females and sixteen males. The average age was thirty-six years. The youngest patient was four years of age and the oldest eighty-two.

Onset and Duration.—The average age at onset was twenty-six years. The disease does not seem to appear at any definite time of the year. The onset was in the fall in nine cases, in the winter in nine, in the spring in eight, in the summer in thirteen, and five patients did not remember when the disease began. Psoriasis had been present for fifty-three years in one case and only three months in one instance. The average duration was twelve years.

Remissions and Seasonal Variations.—In thirty-two cases, 73 per cent, the patients were never entirely free from psoriasis. Complete single remissions occurred in six cases during the summer when the patients took frequent sun baths. One patient did not have any lesions for four years, and two for one year. Pregnancy, rheumatic fever, and arsenic pills were given as the cause of remissions in single cases. No seasonal variation was noticed by twenty-one patients, twenty-two patients thought that the disease was better during the summer, and one patient stated that the eruption improved during the winter. Most of the cases went through cycles of remissions and exacerbations of varying lengths.

Types of Lesions and Regions Involved.—Various sized circinate and gyrate patches were found in thirty cases, small punctate or guttate papules were found in twenty cases, and large infiltrated plaques were observed in eleven cases. In some patients only one type of lesion was present, but in most cases several types were noted. The scalp was involved in thirty-five patients, the arms in thirty-two, the trunk in thirty, the legs in thirty, the face in twenty-one, the dorsum of the hands in thirteen, the external genitalia in ten, the nails in eight, the gluteal cleft and perianal region in four, and the palms and soles in one case. The appearance of lesions on the face in 48 per cent of this series seems high because one usually thinks of psoriasis occurring on the covered portions of the body. The scalp was attacked with greater frequency, 79 per cent, than any other location.

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*From the Ancker Hospital, Saint Paul and the Division of Dermatology and Syphilology, University of Minnesota. Dr. H. E. Michelson, Director.

Symptoms.—Itching was severe in ten cases and moderate or slight in nineteen cases. The pruritus was most marked in those patients who had lesions in the scalp and was intensified during exacerbations when new papules appeared. Painful and bleeding fissures were noted in three cases. One patient complained of severe burning sensations in the palmar and plantar lesions. No subjective symptoms were present in eleven cases. All the patients were embarrassed by the disease. Most psoriatics would not wear bathing suits nor would they attend social gatherings if the eruption was present on the face. The women often wore long sleeved dresses the year round in order to hide the lesions. Psoriasis cannot be considered an asymptomatic disease when thirty-three patients, 75 per cent, in this series had definite disturbing symptoms and all suffered some mental anxiety because of the disease. These figures and most of the others throughout this clinical statistical study agreed with those of Lane and Crawford.[2]

Changes in Body Weight.—A gradual gain or no appreciable change in weight was noted by thirty-one patients. A loss of weight caused by diet or manual labor of 7 pounds in three weeks, 14 pounds in three months, 25 pounds in six months, 26 pounds in four months, 30 pounds in two years, and 50 pounds in one year caused no change in the eruption in six cases. While on a reduction diet two patients lost 35 and 50 pounds in six months and the eruption was reduced to a few scattered papules. New lesions appeared as soon as the patients abandoned the diet and began to gain weight. A gain in weight of 30 pounds in two years, 30 pounds in five years, 35 pounds in six months, 40 pounds in eighteen months, and 40 pounds in five years was accompanied by a marked increase in the psoriatic eruption in five patients. In the eight patients showing an abnormal loss of body weight no appreciable effect on the psoriasis was observed by six patients. While marked loss of weight had little effect on psoriasis an abnormal gain in weight seemed to make the disease much worse.

Intercurrent Diseases.—In thirty-one patients no intercurrent diseases except arthritis, rheumatic fever, or foci of infection were noted. These diseases will be considered later. Measles in two cases, pleurisy in two cases, and parotiditis, quinsy, pertussis, central nervous system syphilis, cholelithiasis, septic abortion, hypertrophied prostate with cystitis, lung abscess, and syphilitic hepatitis in single cases had no noticeable effect on the patients' psoriasis. The eruption became much worse during an attack of nephrolithiasis in one case and cholelithiasis in another. One patient stated that the disease almost disappeared while he was receiving therapeutic malaria for syphilis. The above intercurrent diseases had only a transitory effect on psoriasis in three patients and no effect on the remainder.

Pregnancy.—Pregnancy occurred thirty times in eight patients. No change was noted in the psoriasis during fifteen pregnancies. In fourteen pregnancies the psoriasis almost disappeared. One patient stated that the first lesions recurred on the nipples after she had been nursing her baby for about five months. The lesions usually began to disappear at the end of the first trimester and the disease steadily improved during the remaining months of pregnancy. If a patient's psoriasis improved or showed no change during her first pregnancy a similar experience was observed in succeeding pregnancies.

Arthritis.—Arthritis appeared at some time during the presence of psoriasis in eleven cases (25 per cent). Arthritis did not immediately precede, accompany, or follow psoriasis in any case. Acute arthritis with fever which lasted three or four weeks in five cases, chronic arthritis of two to fifteen years duration in four cases, and acute arthritis with fever followed by chronic arthritis in a single case had no noticeable effect on the eruption. One patient with chronic arthritis and psoriasis stated that both diseases had exacerbations and remissions simultaneously. Although arthritis was observed in 25 per cent of this group of psoriatics, ten of the eleven patients could not see any direct relationship between the signs or symptoms of either disease.

Menstruation.—Twenty patients in this group were subject to menstruation. No change in the psoriasis was seen during the menstrual period in thirteen cases. The lesions became more erythematous, the itching was more severe, or the scale was more noticeable three or four days before or during the menstrual period in seven cases. Menstruation temporarily aggravated the signs or symptoms of psoriasis in 35 per cent of this series.

Foci of Infection.—Definite foci of infection were discovered in twenty-three patients (52 per cent). Nine patients had abscessed teeth, eight had chronic tonsillitis, four had chronic prostatitis, four had cervicitis and cervical erosions, and three had chronic sinusitis. These foci of infection were removed or treated until the infection could no longer be detected, but there was no change noted in the psoriasis.

Familial Incidence.—The patients had ninety-one brothers and ninety-five sisters. Of this number six sisters had psoriasis, but these occurred in two families. One female patient's mother and two sisters had the disease while two brothers and four children were not affected. Another unmarried female patient's father and four sisters had psoriasis while three brothers and two sisters were free from the eruption. The rest of the parents did not have psoriasis. A paternal uncle and a maternal aunt and uncle had the eruption in two instances. As far as could be determined the grandparents were not affected. The children, thirty-eight girls and twenty-nine boys, did not have psoriasis. Psoriatic families were striking when found, but they were very rare in this group (only 4 per cent).

Previous Treatment.—Only two patients had not been treated before they were seen in our clinics. Most patients went from place to place receiving several of the therapeutic measures listed below while some became discouraged when the first agent did not cause prompt disappearance of the eruption. The following remedies were temporarily beneficial: ointments containing ammoniated mercury, sulphur, salicylic acid, or unknown ingredients in eighteen cases; arsenic compounds taken by mouth or given intramuscularly in ten cases; ultraviolet light in four cases; x-rays in three cases; proprietary medicine by mouth in two cases; sun baths in two cases; and ultraviolet light combined with tar ointment, frequent baths, scrubbing with green soap, milk injections, typhoid vaccine, proprietary ointment, Kettering hypertherm, and a reduction diet in single cases. The following remedies were of no benefit: ointments containing ammoniated mercury, sulphur, salicylic acid, or unknown ingredients in twenty cases; arsenic compounds given by mouth or intramuscularly in nine cases; autohemotherapy in four cases; ultraviolet light in two cases; and milk injections, proprietary ointment, proprietary medicine by mouth, x-rays, thyroid extract, and acriflavine injections in single cases. A tar salve and arsenic given by mouth were said to have been the cause of acute exfoliative dermatitis in single cases. In this group of psoriatics the above remedies were of no benefit or gave only temporary relief in the cases in which they were used.

Laboratory Statistical Study

Many laboratory tests were done on the patients to determine whether or not abnormalities existed.

Erythrocytes.—In forty patients the erythrocytes varied from 3,750,000 to 5,500,000 per cubic millimeter of blood. Only eight patients showed red corpuscles below 4,000,000 per cubic millimeter of blood.

Leukocytes.—The leukocytes ranged from 5,000 to 10,800 per cubic millimeter of blood in forty patients.

Differential Leukocyte Count.—The differential leukocyte count was normal in all forty patients.

Hemoglobin.—The hemoglobin was between 70 and 100 per cent in forty patients. Eight cases showed hemoglobins below 80 per cent.

Blood-platelets.—The blood-platelets varied from 150,000 to 380,000 per cubic millimeter of blood in twenty-one patients. They were under 175,000 per cubic millimeter of blood in three instances.

Bleeding Time.—The bleeding time varied

TABLE I

Number of cases	Degrees of free hydrochloric acid	Degrees of total acid
1	12	22
2	0	0
3	5	27
4	28	38
5	37	66
6	33	58
7	58	98
8	12	20
9	0	6
10	51	83
11	0	12
12	12	20
13	42	71
14	32	72
15	0	20
16	38	72
17	0	10
18	8	28
19	45	67
20	11	27
21	6	29
22	16	41
23	0	8
24	35	85
25	0	22
26	0	0
27	14	28
28	34	52

from one minute to three minutes 30 seconds in twenty-eight patients.

Coagulation Time.—Coagulation took place from one minute 30 seconds to six minutes in twenty-six cases. Two patients had coagulation times of eight and nine minutes.

Icterus Index.—The icterus index was from 4 to 12 in thirty patients. Only three had readings below 6.

Blood Calcium.—The calcium content of the blood serum varied between 8.3 and 13.2 milligrams for each 100 c.c. in twenty-nine patients. Two had below 9 and one over 11 milligrams of calcium for each 100 c.c. of blood-serum.

Urea-nitrogen.—The urea-nitrogen ranged from 13.3 to 21 milligrams per 100 c.c. of blood in twenty-seven instances.

Creatinin.—The creatinin varied from .88 to 1.6 milligrams per 100 c.c. of blood in twenty-six patients.

Gastric Contents.—The gastric contents were normal except the amounts of free hydrochloric acid and total acid. The normal figures for gastric acidity are from 25 to 50 degrees of free hydrochloric acid, and from 50 to 80 degrees of total acid. Table I shows the findings in twenty-eight cases.

Free hydrochloric acid was entirely absent or below normal limits in seventeen patients (61 per cent). Total acid was absent or below normal in eighteen (64 per cent). Ayres[1] found a low free hydrochloric acid and low total acid in 52 per cent of his patients. The degree of acid in the gastric secretion did not indicate how the psoriatics would respond on a low fat diet.

Urine.—Albumin, sugar, and casts were not found in specimens from thirty-nine patients. The urine of the patient who had the hypertrophied prostate gland and cystitis showed albumin, casts, and leukocytes.

Basal Metabolism.—The basal metabolic rate varied from minus 12 per cent to plus 16 per cent in twenty-three patients.

Widal Test.—The Widal test was negative in twenty-one cases.

Wassermann Test.—The blood Wassermann reaction was negative in forty-two patients and positive in the two known to have syphilis.

Sedimentation Rate.—The sedimentation rate of the red corpuscles during the first hour was 2 to 18 millimeters for fourteen females, 25 millimeters for one female, and 8, 5, 24, and 33 millimeters respectively for four males.

Mantoux Test.—The Mantoux tuberculin test was negative in fifteen patients and positive in one.

Blood Groups.—Fourteen patients were in group 4, thirteen in group 2, and three in group 3.

Blood Sugar.—The fasting blood sugar ranged from 78 to 130 milligrams per cent in twenty-five patients. Three patients, aged 62, 65, and 74, showed fasting blood sugars of 180, 182, and 160 milligrams per cent. These figures are high even in elderly individuals.

Uric Acid.—The blood of twenty patients (91 per cent of the cases) contained 2 to 4 milligrams per cent of uric acid. The blood of two patients showed 6 and 8 milligrams per cent. The observations of LeCoultre[3] that all psoriatics showed an abnormal increase in the uric acid in the blood could not be substantiated.

Summary and Conclusions

1. Psoriasis does not seem to appear at any definite season of the year.

2. Complete remissions are very rare. The disease is cyclic and the patients usually are better during the summer.

3. Itching is a common and distressing symptom in psoriasis. In this series 75 per cent of the patients had disturbing symptoms.

4. Marked loss of body weight had little effect on psoriasis, but an abnormal gain in weight seemed to make the disease much worse.

5. Intercurrent diseases have transitory or no effect on psoriasis.

6. Pregnancy had no effect or only temporarily benefited psoriasis.

7. There was no direct relationship between psoriasis and arthritis in this series.

8. Menstruation temporarily aggravated the signs and symptoms of psoriasis in 35 per cent of this series.

9. The removal or treatment of foci of infection had no noticeable effect on psoriasis.

10. The existence of psoriatic families was striking, but their occurrence was very rare in this roup.

11. Treatment which was of benefit in about half of the cases was of no benefit in a like number.

12. Many laboratory tests were done. The gastric contents showed the only abnormality. Free hydrochloric acid was entirely absent or below normal limits in seventeen patients (61 per cent). Total acid was absent or below normal in eighteen (64 per cent).

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FURTHER STUDIES IN THE USE OF QUINIDINE IN THE TREATMENT OF CARDIAC IRREGULARITIES*

S. A. WEISMAN, M.D.
Minneapolis, Minnesota

IN 1936 I presented a report on a five-year follow-up study on the ambulatory treatment of auricular fibrillation with quinidine.[3] In discussing the treatment it was pointed out that, in order to get the most effective results, quinidine should be given in small doses to start with, slowly increasing the amounts daily, and that these small amounts should be given at frequent intervals. By this method the patient is more apt to establish a tolerance for quinidine and also to avoid the toxic effects that are so often attributed to its use. Since that time I have been engaged in the study of the excretion time of quinidine from the blood and from the various organs of the body to determine how rapidly the drug is eliminated after it has been given intravenously or orally. It is the purpose of this presentation to give a preliminary report of these findings and to present an eight-year follow-up study of the ambulatory treatment of auricular fibrillation and the method used.

Dogs weighing about twenty kilograms were mainly used in our animal experiments. A few rabbits were also used. Amounts of quinidine up to 600 milligrams were given intravenously to these animals, and samples of the blood were taken at intervals of five minutes or more after the injection (Table I). It was found that the drug was eliminated from the blood stream very rapidly. Less than 6 per cent of the quinidine was found in the blood samples taken seven minutes after the drug was injected intravenously. Repeated samples of the blood taken for several hours after did not reveal any trace of the drug. These findings are in accord with those of Weiss and Hatcher.[2] Working with cats, they showed that 95 per cent of quinidine given intravenously was eliminated from the blood in about five minutes. Hatcher and Gold[1] examined the blood of three patients who were given 650 milligrams of quinin (an isomer of quinidine) intravenously. Samples of blood were taken six to twenty minutes after the injection. They state

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TABLE I. CONCENTRATION OF QUINIDINE IN THE BLOOD (OF ANIMALS)

Animal	Sex	Weight (Kilos)	Intravenous Dose (Mg.)	Time Consumed for Injection (Minutes)	Time Intervals at which Samples Were Taken		Mg. "Q" H_2SO_4 per c.c. Blood	Per Cent Q in Blood
					Hrs.	Mins.		
Rabbit	M	3.225	90	3.5		7	0.00	0
						15	0.00	0
Dog 1	M	23.0	500	6.0		5	0.00	0
						30	0.00	0
					1	00	0.00	0
					2	00	0.00	0
					4	00	0.00	0
Dog 1	M	23.0	500	5.0		5	0.00	0
						10	0.00	0
						24	0.00	0
Dog 1	M	23.0	600	2.0		7	0.0196	5.7
						15	0.00	0
Dog 2	M	8.6	240	2.5		7	0.0186	5.0
						12	0.00	0
						15	0.00	0
						30	0.00	0
					1	00	0.00	0
					2	00	0.00	0
Dog 1	M	23.0	600	4.0		7	0.0196	5.7
						15	0.00	0
						30	0.00	0

Note: Controls run by the Bromate-Bromide method repeatedly resulted in zero.

that "none of the three contained more than a fraction of a milligram, showing that much of the greater part of the quinin injected had left the circulation."

Since quinidine is usually given orally in the treatment of cardiac disturbances in rhythm, especially in auricular fibrillation, it was believed desirable that a study of the excretion time of quinidine from the blood be made after the drug was given by mouth. This study was carried out mostly on patients. Two groups of patients were used. In the first group, each patient was given a single dose of quinidine. In the second group, each patient was given quinidine in repeated doses one hour apart. It was the purpose of this experiment to see if there was any difference in the excretion time of the drug in the two groups. Were there any accumulative effects when quinidine was given in repeated doses at short intervals?

Eight patients were given single doses of quinidine in amounts up to 10 grains. Examinations of the blood taken thirty minutes after administration of the quinidine showed that less than 10 per cent of the drug was left in the blood. Samples of the blood taken one hour after ingestion of the drug showed no evidence of quinidine. In other words, after giving quinidine by mouth in single doses, over 90 per cent of the drug had left the blood in thirty minutes, and practically all of the quinidine was eliminated from the blood at the end of one hour (Table II).

Six patients were given from 3 to 10 grain doses of quinidine at one-hour intervals, amounting to a total of ten to thirty grains for each patient (Table III). Samples of blood taken one half-hour after the last dose showed that on the average about 20 per cent of the drug was present in the blood. At the end of one hour about twice as much quinidine was present in the blood as there was at the end of the first half-hour. However, ninety minutes later—that is, one and one-half hours after the ingestion of the drug—no quinidine was found in the blood. This shows that (Fig. 1) when the drug is given in repeated doses at short intervals, there appears to be an accumulative effect, or the excretion time of the drug is delayed. The height of concentration of the drug in the blood is reached in thirty minutes or less after a single dose is given, but when the quinidine is given in repeated doses at short intervals of one hour, the point of maximum concentration of the drug in

TABLE II. CONCENTRATION OF QUINIDINE IN BLOOD (OF HUMANS)
(Giving single doses orally)

Name	Sex	Age	Weight (Kilos)	Amount Given (in tablets)	Time Blood Taken After Last Dose Hrs.	Mins.	Mlg. "Q" c.c. Blood	Per Cent "Q" in Blood	Remarks
GW	M	67	61.3	5 gr.		30	0.0055	8.0	Normal
					1	00	0.0000	.0	
					1	30	0.0000	.0	
B	M	45	80.5	5 gr.		30	0.00524	10.0	Normal
					1	00	0.00000	.0	
					1	30	0.00000	.0	
G	M	45	76.7	5 gr.		30	0.00442	8.0	Fibrillating
					1	00	0.00000	.0	
					1	30		.0	
D	F	52	65.9	5 gr.		30	0.00525	8.13	Normal
					1	00	0.00000	.0	
W	F	17	61.3	5 gr.		30	0.0066	9.7	Normal
					1	00	0.0000	.0	
C	F	23	42.3	5 gr.		30	0.00748	7.5	Normal
					1	00	0.00000	.0	
C	F	57	56.8	5 gr.		30	0.0070	10.0	Normal
					1	00	0.0000	.0	
OV	M	60	72.2	10 gr.		30		7.1	Normal
					1	00		.0	
					1	30		.0	
					2	00		.0	
					2	30		.0	
					3	00		.0	
					3	30		.0	
					4	00		.0	
					4	30		.0	
					5	00		.0	
					5	30		.0	
					6	00		.0	
					6	30		.0	

TABLE III. CONCENTRATION OF QUINIDINE IN BLOOD (OF HUMANS)
(Giving repeated doses orally)

Patient	Age	Weight (Kilos)	Amount of Dose (given orally in tablets)	Time Blood Taken After Last Dose Hrs.	Mins.	Mlg. "Q" c.c.	% "Q" in Blood	Disease
Mr. O.	60	75.4	2-5 gr. doses 1 hr. apart (Tot. 10 gr.)		30	0.0125	11.0	Coronary; heart regular
				1	00	0.0045	4.0	
				1	30	0.0000	.0	
Mr. F.	56	82.2	2-5 gr. doses 1 hr. apart (Tot. 10 gr.)		30	0.0208	20.0	Coronary; fibrillating
				1	00	0.0500	48.2	
				1	30	0.0000	.0	
Mr. F.	56	82.2	3-5 gr. doses 1 hr. apart (Tot. 15 gr.)		30	0.0266	17.0	Coronary; fibrillating
				1	00	0.0700	45.0	
				1	30	0.0000	.0	
Mr. C.	68	87.7	3-5 gr. doses 1 hr. apart (Tot. 15 gr.)		30	0.0260	17.8	Coronary; fibrillating slight decompensation
				1	00	0.0560	46.4	
				1	30	0.0000	.0	
				2	00		.0	
Mr. W. C.	46	85.0	4-3 gr. doses 1 hr. apart (Tot. 12 gr.) (780 mgm.)		30	0.0260	21.5	Coronary; fibrillating
				1	00	0.0609	50.4	
				1	30	0.0000	.0	
				2	00		.0	
Mrs. F.	52	56.8	3-10 gr. doses 1 hr. apart (Tot. 30 gr.)		30	0.0982	22.0	Hyperthyroid; fibrillating
				1	00	0.2164	48.4	
				2	00		.0	

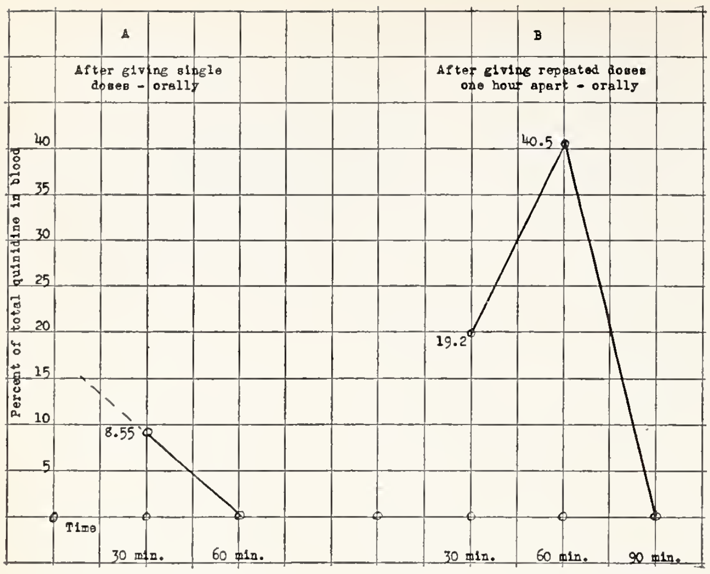

Fig. 1. Concentration of quinidine in blood (human).

the blood stream is reached in sixty minutes or less after the last dose is given.

We believe the error in carrying out this work is not great. We used a burette devised by Dr. A. D. Hirschfelder of the Department of Pharmacology, whereby quantities of quinidine as small as 0.0005 of a milligram can be determined.

This study suggests that it is perhaps better to give frequent small doses for a more favorable result. When this is done, there appears to be a more gradual increase in the concentration of the drug in the blood and also a more gradual elimination of the drug from the blood. It is perhaps for this reason that in our experience very few patients have complained of any toxic effects.

I started out by saying that in 1935 I gave a five-year follow-up study on the ambulatory treatment of auricular fibrillation with quinidine. I shall now give an eight-year follow-up study.

To date Mr. Or, Mrs. M., and Mrs. G., three patients who were in the group of seventeen cases reported in 1932,[4] are still regular. Mr. Or and Mrs. M. have now been regular for seven years, and Mrs. G. has now been regular for eight years (Table IV). Mr. B. died last year following on operation upon an aneurism of the popliteal artery. He had been regular for six years. I have lost track of Mr. P., who in 1937 had been regular for six years. These last two cases were reported as regular in 1936.

The three cases heretofore mentioned are very grateful for their marked improvement since their hearts have been beating regularly. They were more or less invalids for periods of six months to three years before starting treatment. For the past seven years in two cases and eight years in one case, these individuals have been self-supporting and useful citizens. They have reported diligently almost every month for a check-up. They have been taking digitalis and quinidine all this time. As I said before, I believe that if more of the cases originally reported could have been followed up as closely as these three, I have no doubt that I should have had a larger number who would still be regular.

I believe the method that we use in giving quinidine is very important for two reasons: (1) the patient is more apt to establish a tolerance for the drug; and (2) the method tends to eliminate the toxic symptoms we hear so much about that are attributed to quinidine.

Two things should be kept in mind. First, begin with small doses, and, second, repeat doses at short intervals. Our clinical experience with some 200 cases, treated in the cardiac clinic at the University of Minnesota, leads us to believe that quinidine is a very valuable and effective drug in the treatment of this disease. We believe that quinidine should be given in small doses to start with and the dose increased daily and very slowly. In repeating the dose of quinidine, give it at one-hour intervals until the total amount desired is given, then quit for that day. Another very important point is first to digitalize the patient. The heart rate must be slowed down to about 80-70 before starting the use of quinidine. After the heart rate has slowed down, keep the patient on a maintenance dose of digitalis (usually one U.S.P. cat unit) all the time during the treatment with quinidine.

I will again repeat the method we use in giving quinidine in ambulatory cases for the treatment of auricular fibrillation. Give as follows: first day, one dose of 1.5 grains (0.1) at 8 A.M.; second day, 1.5 grains (0.1) at 8 A.M. and at 9 A.M. Then continue as shown in Table V.

If the heart has not returned to regular rhythm after giving thirty grains of quinidine for a few days, I discontinue its use. I have found that, if it takes much more than thirty grains to restore normal rhythm, it is very difficult to maintain a normal rhythm.

After the heart is restored to normal rhythm, gradually cut down the dose of quinidine, say about five grains daily until the patient gets about fifteen grains a day. The maintenance dose can

TABLE IV

Name	Etiology	Age	Duration of Fibrillation	Regular
Mrs. Or.	Coronary	60	6 months	7 years
Mrs. M.	Rheumatic	53	3 years	7 years
Mrs. G.	Hypertension and Coronary	70	2 years	8 years

TABLE V. METHOD OF GIVING QUINIDINE

Day	Time of Dose			
	8 A. M.	9 A. M.	10 A. M.	11 A. M.
1	0.1 (1½ grain)			
2	0.1	0.1		
3	0.1	0.1	0.1	
4	0.1	0.1	0.1	0.1
5	0.2 (3 grains)	0.2	0.2	
6	0.2	0.2	0.2	0.2
7	0.33 (5 grains)	0.33	0.33	
8	0.33	0.33	0.33	0.33
9	0.33	0.67 (10 grains)	0.67	
10	0.67	0.67	0.67	

be ten grains or even five grains in some cases. Usually five grains for two doses one hour apart is the average maintenance dose. This maintenance dose can be kept up indefinitely, together with digitalis.

Conclusions

1. About 95 per cent of the quinidine given intravenously leaves the blood in about seven minutes or less. When quinidine is given intravenously (to dogs), less than 6 per cent of the drug remains in the blood at the end of seven minutes.

2. Quinidine given by mouth in single doses reaches its maximum concentration in the blood in thirty minutes or less and leaves the blood before one hour.

3. When quinidine is given orally in repeated doses, it reaches its maximum concentration in the blood in one hour or less and is all eliminated in one and one-half hours.

4. It appears that quinidine is accumulative in the blood when given in repeated doses one hour apart.

5. An eight-year follow-up study on the ambulatory treatment of auricular fibrillation is presented.

6. Our method of treating auricular fibrillation with quinidine is again presented.

I wish to express my appreciation to Dr. A. D. Hirschfelder of the Department of Pharmacology for his valuable suggestions and aid in carrying out the chemical procedures for the quantitative analysis of quinidine in the blood and tissues. The method used will soon be published elsewhere.

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POWERS AND DUTIES OF TOWNSHIP BOARDS OF HEALTH IN MINNESOTA

O. C. PIERSON, Director
Division of Administration, Minnesota State Board of Health
Saint Paul, Minnesota

VARIOUS governmental divisions and forms of local government are provided for by the Minnesota statutes. The governing body of a county is the Board of County Commissioners. The governing bodies of cities and villages are the local councils, and for a town the board of supervisors. The statutes provide for local boards of health under each of these divisions of the local government. County boards of health are appointed by the boards of County Commissioners. City and village boards of health are appointed by city and village councils. The town board of supervisors itself, according to the statutes, must also serve as a board of health for the town, and in effect therefore acts as two separate and distinct boards composed of the same personnel, one board being the general governing body of the town, and the other the town board of health. The powers and duties of the governing bodies and of the boards of health for each of these governmental divisions are prescribed by the statutes.

When a question of public health procedure arises within a town, the town board must determine what the laws and regulations provide for such procedure. If its duty in the matter is found in the laws or regulations pertaining to the duties of local boards of health, then the board acts in that matter as a board of health, just as a city or village board of health would be required to act in a city or village. If its duty lies in the laws pertaining to the powers and duties of town boards of supervisors, then it should act as the board of supervisors and not as the board of health. The State health authorities are not qualified to advise members of boards of supervisors as to their duties as members of such boards. But they are qualified to advise them as to their duties as members of town boards of health.

There is one particular difference between the organization and duties of town boards of health and of city and village boards of health. The statutes say that one member of a city or village board of health must be a physician, who shall be the health officer of the city or village and the executive of the local board of health. Another part of the statutes says that if no member of the town board is a physician, the town board shall appoint a physician as health officer for the town. Another part of the statutes says that all local health officers shall enforce all health laws and regulations and obey the directions of the State Board of Health in the control of communicable diseases. But still another part of the statutes says that for towns the chairman of the town board shall see to it that all necessary things are done to control communicable disease and to enforce the state health laws and regulations. This last provision seems to be contradictory or inconsistent with that other provision which says that it is the duty of all local health officers to enforce all health laws and regulations.

Based on the opinion of the Attorney General's department, the State Board of Health interprets these various parts of the statutes to mean that the medical health officer of the town is to perform those medical functions which the town board or its chairman, not being physicians, are unqualified to perform, and then, upon the findings and advice of the medical health officer, the chairman of the board must see to it that the laws and regulations relating to the matter are carried out. This opinion has been uniformly accepted. It is probable that the establishment or release of quarantine by the medical health officer of a town would be legal, but the actual responsibility for it rests with the chairman, and possibly only the chairman or the town board as a whole could be successfully prosecuted for failure to establish and enforce the quarantine and other control measures which the health regulations require.

While the appointing of such a medical health officer for the town is mandatory, many boards for one reason or another have not done it. No attempt has been made to compel them to do it if in each instance, when such medical services are necessary, the board or chairman employs a physician. That is accepted as complying with the spirit of this law.

The law says that a city *must* and a village *may* provide for a board of health with one member a physician and such physician the health officer, but that if a village has not provided for a legal board of health, then the town board of health of the town in which that village lies must look after the health affairs of that village. Under such conditions the village is responsible to the town for any expense the town incurs in looking after such village's health affairs.

The law says that the compensation of all local health officers shall be prescribed by the body appointing them and, together with their necessary expenses, paid by the municipality or county they serve. This seems to cover compensation for medical health officers of townships as well as villages and cities, but does not seem to definitely provide for compensation to the chairmen of town boards of health. However, town boards may legally pay their chairman for his services as chairman of the Town Board of Health.

The law also provides for a county board of health and a county health officer and says that such health officer must look after the health affairs of all unorganized towns within the county. He has no direct authority in organized towns or villages or cities except to advise with the health officials of those places.

Three matters on which there is much lack of understanding on the part of local and county boards, physicians, attorneys, and sometimes even county attorneys, are:

1. Expenses in the control of communicable diseases;
2. Dealing with dangerous cases of tuberculosis;
3. Abatement of nuisances.

To consider these three in order:

Expenses in Control of Communicable Diseases

The law says that the chairman of a township shall employ at the cost of the town all medical and other help necessary in the control of communicable disease, and, upon receiving a properly itemized statement of such expenses, the county shall reimburse the town by one-half of the amount. If the County Board refuses to so reimburse the town, the town board may appeal to the District Court. If the Court then finds that the expenditure was necessary and as authorized by the law, it will order the county to pay the town one-half of such amount.

It should be noted that this law refers specifically to *"expense necessary to control"* communicable disease. If the town board or its chairman incurs expense which is not "necessary to control," then such expense is not authorized by this particular law and the county is not responsible under this law for the reimbursement of any part of it. Medical treatment, nursing, medicines, food, fuel, etc., are not as a rule necessary for the control of the disease but usually are for the comfort and relief of the patient. If the patient, or his parents or guardians, are not financially able to provide such things, then the providing is a matter of poor relief. The fact that the need for such things arises largely because the patient is afflicted with a communicable disease, and if well he would be able to provide for himself, does not alter the matter. Such things are "poor relief" regardless of the nature of the sickness. It may possibly be the duty of the town board to provide such relief, but, if so, they do it as the board of supervisors and not as the board of health and not under any authority conveyed in these sections of the law relating to expenses in the control of communicable diseases.

But considerable latitude should be given when determining the purpose of such relief and what expenditure is necessary and legal for the control of communicable disease. That such expenditure may help cure or relieve the patient may be immaterial if it also tends to protect the public from infection. And so expenditures for vaccination against smallpox, immunization against diphtheria, curative doses of antitoxin, surgical removal of tonsils from persons in whom virulent diphtheria bacilli persist for a long time, and surgical removal of certain internal organs from permanent typhoid fever carriers, may be legitimate because they result in preventing sickness and making those treated no longer a menace to the public. Likewise expenditures for hospitalization in some diseases and under certain conditions may for the same reason be legitimate. This last is true for tuberculosis where home and living conditions are such as to make hospitalization (preferably in a tuberculosis sanatorium) quite necessary to remove that source of danger to the public.

Examination of suspected cases of the communicable diseases, taking of cultures and other specimens for laboratory examination, and examination to determine if quarantine may be discontinued, are obviously necessary and proper steps for the control of the disease.

But the town board cannot be compelled to pay for any services or expenses, however necessary they may have been to control communicable disease, unless they were ordered by the board or chairman. Frequently a physician is called by the family and treats members sick with communicable disease. Some of his service is necessary in control, and if he had not done it, it would have been necessary for the town's medical health officer, or some other physician employed by the town board of health, to do it. The family being poor, the physician sends his bill to the town board. If the town board has not provided a regular medical health officer to give such service, it would seem that it should authorize such service of that attending physician as by its authority, and pay that part which was necessary to control the disease, instead of escaping a necessary expense on the technicality that the service was not ordered by the board. Had such service been delayed until the chairman had employed a physician to visit the case, the danger of spread of the infection to other residents of the town would very likely have been increased. But physicians should always make it a point to first secure the chairman's order if they expect the town to pay for any of their services.

Dealing with Dangerous Cases of Tuberculosis

It should be borne in mind that tuberculosis is a communicable disease, and that the law which says the chairman shall employ all help necessary to control communicable diseases applies to tuberculosis. Other laws which relate especially to tuberculosis say that if a health officer finds a case of tuberculosis which is endangering the public he may report the facts to the Board of County Commissioners, and that board may then commit the case to a tuberculosis sanatorium. If that county has its own county sanatorium, the County Board naturally will send the case there; otherwise it may send it to a sanatorium maintained by some other county. If the County Board so commits the case, the county will pay the necessary maintenance costs. But this law does not say the County Board "must," it says, "may," and for some such cases County Boards have refused to so commit and pay maintenance costs. If the County Board refuses to so commit, the local health officials must proceed under those laws which relate to expenses in control of communicable disease, and usually the most effective and cheapest way of doing it is to send the case to a sanatorium and pay the necessary cost of maintenance. This cost is a necessary expense in the control of communicable disease, and the town has a just claim against the county for one-half of the amount. So if the County Board commits the case the county pays all the costs. If the County Board fails to commit, it must nevertheless reimburse the town for one-half of the costs if the town health officials do their duty in controlling the spread of the disease through isolation or quarantine of an infectious person in a sanatorium or other proper place.

The Abatement of Nuisances

The law says that when any nuisance, source of filth, or cause of sickness is found on any property, the health officer of the city, village *or township* in which it is, shall serve an order on the owner or occupant of that property, to remove the nuisance. If such order is not obeyed, then the health official shall have the nuisance removed or abated and report the cost of doing it, which must not exceed $25.00, to the town, village or city clerk, who shall certify the amount to the County Auditor. The County Auditor shall assess the cost on the tax roll against that property, and, on receipt of the tax money, reimburse the town. It seems clear from the language in this law and the cost limitation, that local boards of health, health officers, or chairmen are not empowered to condemn buildings or businesses or say where this or that may be located or carried on, but only are empowered to compel cleaning up, removal of offensive matter, the cleaning out, repairing and fly-proofing of privies, cesspools, etc., which, if their order on the owner or occupant of the premises is not obeyed, they can carry out at a cost not to exceed $25.00. The only penalty in this law for failure to obey such order is the taxing of the property in an amount necessary to carry out such order, but not in excess of $25.00. It would be unfortunate if there were no other provisions in the laws for the abatement of nuisances, but other sections of the laws authorize city and village councils to adopt and enforce nuisance ordinances. By such ordinances they may prohibit the location of, or doing, certain things in the municipality or in certain parts of the municipality, and may regulate their construction and maintenance. An ordinance may make it the duty of the health officer or of the village marshal (preferably the latter) to enforce the ordinance. Under such ordinances the citizens will know what they may and may not do, violations will be misdemeanors and arrests may be made and fines imposed. The adoption of such ordinances is the most effective way of dealing with the nuisance problem, and if their enforcement is made the duty of the local police officials it will largely relieve the health officer of duties which are often onerous and do not require medical qualifications. The duty of the local health officer to act under the state law will still remain if the ordinance provisions are not enforced and nuisances exist.

Unfortunately, this power to adopt ordinances does not extend to *towns* since town boards do not have power to adopt ordinances. Very frequently there are nuisances in towns which cannot be effectively abated by serving and enforcing orders to clean up as provided for in the state law. In such cases the final remedy seems to lie in an appeal in the courts by those affected by such nuisances. Such appeal is provided for under another section of the statutes which says that any one affected by a nuisance may bring an action in the courts and the courts may issue injunctions and award damages.

For the purpose of this discussion we may divide nuisances into two classes:

1. Private nuisances
2. Public nuisances

In considering the first of these, *private nuisances,* health officials should understand that it is not their duty to deal with nuisances that may properly be construed as strictly "private nuisances." Private nuisances are such as affect only one individual or family, and in no way involve the health, comfort or general welfare of the rest of the town or that section of the town. But the distinction between a "private" and a "public" nuisance may not always be easy to draw. An insanitary privy, cesspool, manure pile, garbage accumulation, or other similar small nuisance condition, may primarily and particularly affect only one or two individuals or families, but also may affect the general decency, welfare or health of the whole town, or a considerable section of the town. It then should properly be considered a public health nuisance and be dealt with under the provisions of the public health nuisance laws and ordinances. Strictly private nuisances, such as spite fences, etc., which have no general public health significance, may only be dealt with by the courts through private action in the courts.

Public nuisances, for the purpose of this discussion may be subdivided into three classes:

1. The ordinary nuisance of the public health type;
2. The offensive trade nuisance;
3. The state-wide or sectional nuisance.

The ordinary public health nuisance includes such things as privies, cesspools, dumps, garbage, pigpens, dead animals, etc. Although these may primarily only affect one or a few people, they also affect the community as a whole. Insofar as the laws give authority for it, health officials should deal with them, and village and city councils should adopt ordinances to control them.

The offensive trade nuisance is also subject to control by the health officials under the general nuisance laws and regulations, but in addition there are special laws relating to offensive trades. These special laws say that no one may operate an offensive trade except under written permission by the board of health of the town, village or city in which located. A severe penalty is provided for operating without such permit. Whether a business or occupation is or is not an "offensive trade" is not always easy to say. The laws relating to them do not definitely define what an offensive trade is, nor have the courts done so. Each case must be determined on its own individual merits, and this may be a matter which requires legal advice or possibly decision of the courts. It is generally accepted that just because in certain occupations there are odors which are more or less disagreeable to some persons living or working in the vicinity, such occupations are not necessarily to be classed as "offensive trades." Otherwise it might be necessary to require offensive trades permits for such things as tire repair shops, bakeries, meat markets, groceries, canneries, and many other things. The State Board interprets the intent of this law to be, that an "offensive trade" is an occupation in which very offensive and widespread odors are impossible or exceedingly difficult to prevent. In this class may very properly be included such things as rendering establishments, hog feeding and fattening ranches, and, in many cases, slaughter houses.

Statewide or sectional nuisances include nuisance conditions which affect or cover a considerable area of the state and a considerable part of the population. Those who suffer special injury from a statewide nuisance may seek relief in the courts. If a county is particularly affected, through its county attorney it may bring the matter into the courts, and on behalf of the State, the State's Attorney General may do so.

ULTRAVIOLET THERAPY*

MILAND E. KNAPP, M.D.
Minneapolis, Minnesota

Physics and Physiology

THE wave-length of visible light ranges from approximately 770 millimicrons at the red edge of the spectrum to 390 millimicrons at the violet. One millimicron or μ is one-millionth of a millimeter or one twenty-fifth millionth of an inch. The ultraviolet or invisible radiations of shorter wave-length than the violet then continue to about 10 μ where it overlaps the roentgen radiations. They are usually divided into three groups, the near ultraviolet from 365 to 290 μ, the far ultraviolet from 290 to 180 μ, and the extreme ultraviolet from 180 μ to the range of the x-ray group.

It is important that we understand the variations in wave-length because much of the confusion in the literature concerning ultraviolet radiation has been a direct result of lack of definite information about the exact type of radiation used.

The penetration of ultraviolet rays through the tissues varies with the wave-length although they all are absorbed in the superficial layers. The far ultraviolet (180 to 290 μ) penetrate the dermis only 0.1 to 0.5 mm. This is really only through the stratum corneum of the skin while the near ultraviolet (290 to 365 μ) penetrate 0.5 to 1 mm. according to Coblentz.[2] This is into the stratum mucosum or basal cell layer of the epidermis.

The penetration of ultraviolet radiations through inorganic substances also varies with the wave-length. The short wave limits of transparency of various substances is shown in the following table (after Luckiesh).[6]

	millimicrons
Fluorite	125
Quartz (crystalline)	145
Quartz (fused)	185
Blue rock salt Beyond	225
Light crown glass	295
Blue Topaz	296
Ruby	300
Medium crown glass	300
Light flint glass	305
Blue diamond	315
Emerald	320
Heavy flint glass	340

Thus window glass and especially heavy glass is opaque to most of the active radiations. Quartz is the most practical medium of those transparent to most of the ultraviolet radiations. There are some special types of glass which are transparent to the wave-length of ultraviolet in the region of 320 to 290 mu.

Physiology

The action of ultraviolet radiation is photochemical in nature. There is a definite latent period of several hours before the maximum effect is reached. This is followed by a gradual return to normal. The exact nature of the underlying physiological process is not known but the physiological effects may be listed as follows according to Bachem:[1]

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*Condensed from a lecture given at the Seminar of the American Congress of Physical Therapy at Chicago, Illinois, September 7-10, 1938.

PHYSIOLOGICAL EFFECTS OF ULTRAVIOLET LIGHT

Local

1. Erythema (with short latency)
2. Ultraviolet conjunctivitis (snow blindness)
3. Vasodilation
4. Pigmentation
5. Blistering (sunburn)
6. Tissue stimulation
7. Germicidal and cytocidal effects
8. Sterol activation

Systemic

1. Sympathetic nervous system stimulated (or depressed)
2. Assimilation and elimination increased
3. Internal secretion increased
4. Calcium and inorganic phosphorus fixed
5. Gastric secretion increased
6. Hemoglobin, erythrocytes and platelets increased
7. Clotting time shortened
8. Blood pressure lowered
9. Resistance toward infection mobilized
10. Toxic effects.

Many and perhaps all of these effects vary according to the wave-length. For example, in general the shorter wave-lengths are more bactericidal. Indeed there seems often to be optimum wave-lengths for the destruction of individual types of organisms. The longer wave-lengths are more pigment forming and those near to visible light produce the best tan. The erythemogenic effect has one peak at about 250 μ and another at about 300 μ. The antirachitic effect also follows a definite wave-length distribution as shown by Coblentz.[3]

It is probable that many of the other effects will follow definite wave-length curves also. These may be determined in the future by spectrographic methods with suitable filters.

Technic

Exact technic is essential to progress in any field and the field of ultraviolet irradiation is no exception to this rule. One of the most powerful impediments to progress in this field has been the lack of specific technical details when results have been reported.

In specifying a technic we must first know the spectral composition of the source of radiation used. This varies, of course, with the type of lamp and the filters used. This information can be secured from the Council on Physical Therapy of the American Medical Association if desired. Secondly, we must give an accurate dosage of radiation. And, third, we must consider the skin susceptibility of the individual patient. In general brunettes are more resistant to ultraviolet, blonds are more sensitive and red heads are the most sensitive.

The dosage is determined by the spectral distribution and intensity of the source, the distance of the source from the part to be treated, and the angle at which the rays strike the part.

Coblentz[4] has suggested that the dosage should be measured in Finsen units. He defines this unit as a "radiant flux of 10 microwatts (100 ergs) per square centimeter per second of homogeneous radiation of the wave-length 2,967A°."

Other units of erythemogenic action have been suggested by other authors.

The most practical unit for the ordinary clinician is the minimal erythema dose. This may be defined as the shortest exposure at a certain distance that will produce a perceptible reddening of the skin which disappears within twenty-four hours. This will vary, of course, with different skin types. However, it is easily determined for any given lamp by exposing small areas on the anterior surface of the forearm to a series of regularly increased quantities of radiation and thus determining the one which causes a minimum perceptible erythema. The dosage varies according to the duration of exposure, the distance from the patient, and the angle at which the rays strike the part to be treated.

The dosage varies directly with the duration of exposure.

The inverse square law states that the intensity of radiation from any point source varies inversely as the square of the distance from the source when the absorption by air is negligible. This means that reducing the distance by one-half provides not twice but four times the dose. And reducing the distance to one-third does not produce three times the dose but nine times the previous dose.

The "cosine law" states that the energy per square centimeter is proportional to a constant times the cosine of the angle made by a line connecting the source and the patient, and the line perpendicular to the patient's body. That constant is the light per square centimeter when the patient is perpendicular to the line joining the light and the patient. This means that the lamp should be as nearly at right angles to the part to be treated as possible.

One must be sure that the rays are not absorbed by ointments, crusts, dressings etc., that cover the part to be treated. The part should be thoroughly cleansed with soap and water if ointments have previously been used. The lamp should be kept clean and checked frequently for efficiency.

Indications

Ultraviolet irradiation has been recommended for such a ridiculously large variety of diseases that it is absurd to name them all or even to imagine that this agent is really of value in them all. However, there are a few diseases where the use of ultraviolet radiation is scientifically correct and a number more where its use is supported by enough clinical evidence to be impressive.

1. *Rickets, Infantile Tetany or Spasmophilia, and Osteomalacia.*—The well-proved ultraviolet effect upon calcium metabolism by the formation of Vitamin D makes its use rational in these conditions.

2. *Tuberculosis.*—Most authorities agree that ultraviolet radiation is useful as an adjunct to the usual treatment (bed rest, food, et cetera in extrapulmonary tuberculosis. This includes tuberculosis of the bones or joints, of lymph glands, of the peritoneum and intestines, and of the genito-urinary system.

In some selected forms of chronic pulmonary tuberculosis many workers think that ultraviolet therapy is indicated while others believe that it is contra-indicated in all forms of pulmonary tuberculosis.

3. *Erysipelas.*—In my opinion ultraviolet irradiation is the method of choice in the treatment of erysipelas. The mode of action is not yet understood but the clinical results can no longer be doubted. We have treated more than 500 cases by this method with very satisfactory results.

However, it is extremely important that heavy doses of ultraviolet be given in the treatment of erysipelas—six to twenty erythema doses being used according to the type and efficiency of the lamp employed.

4. *Certain Skin Diseases.*—Many dermatologists employ ultraviolet as an aid in the treatment of certain skin affections. Among these may be listed lupus vulgaris, scrofuloderma, pityriasis rosea, psoriasis, acne vulgaris, adenoma sebaceum, erythema induratum, and alopecia areata.

5. *Indolent Ulcers.*—Some well-controlled work has indicated that ultraviolet is of value in the treatment of indolent ulcers and to promote the healing of wounds in general. This includes the use of ultraviolet in the treatment of chronic draining sinuses, decubitus ulcers and such conditions when it is possible to reach the affected areas with ultraviolet radiation. It is important to use small doses.

6. *Burns.*—Following extensive burns the healing period may be greatly shortened by the use of ultraviolet radiation according to Peck.[7]

7. *Tonic Ultraviolet.*—In many chronic diseases where malnutrition or deprivation of sunlight due to hospitalization is a factor, the use of ultraviolet radiation is indicated for its tonic and psychological effects, as well as its antianemic effects. It may also aid in the prevention of bed-sores. In this group may be included sufferers from arthritis of any type, paralysis, multiple sclerosis, neurasthenia, hemiplegia, and many other chronic conditions. However, "as far as normal persons are concerned, the claim that exposure to ultraviolet rays increases or improves the tone of the tissues or of the body as a whole, stimulates metabolism or tends to prevent colds has not been conclusively substantiated" according to the Council on Physical Therapy of the American Medical Association.[5]

Contraindications

The use of ultraviolet radiation is generally agreed to be contraindicated in active and progressive forms of pulmonary tuberculosis, hyperthyroidism, diabetes, highly nervous people, patients with advanced cachexia or inanition and aged people with acute or chronic nephritis or myocarditis.

It is also contraindicated in certain skin diseases. These include: all forms of generalized dermatitis, lupus erythematosus, herpes simplex, erythema solare perstans, xeroderma pigmentosum, hydroa estivale, freckles, atrophy, keratoses, and prematurely senile skin.

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PERFORATING WOUNDS

JOHN M. CULLIGAN, M.D.
Saint Paul, Minnesota

ACCIDENTS which produce perforation of the large cavities of the body are serious and tax to the utmost the judgment and technical ingenuity of the surgeon. The mortality is necessarily high due to the fact that vital organs are frequently involved in the perforation and there is always the danger of infection.

"When in doubt, do not operate immediately" is a fairly good maxim to follow when dealing with obscure diseases. However, the converse is very definitely true when dealing with any perforating wound. The dictum "When in doubt, operate" is the much safer procedure. If the perforation has only resulted in a wound of the abdominal or chest wall and if no vital structures are injured, no harm is done by a simple incision to ascertain the extent of injury (Cases 1, 2 and 3). On the other hand many patients who have perforating wounds of vital organs may not appear ill when first seen. Delay until the patient appears ill results in a great increase in both mortality and morbidity. The dangers of increasing shock, hemorrhage and infection are multiplied with every hour of delay. Therefore, immediate exploration should be the rule in dealing with wounds of this nature.

Food Ingestion

Injury sustained to the gastro-intestinal tract shortly after a large meal carries more risk from perforation and spread of infection than when the stomach and small bowel are relatively empty. Soiling and infection of the peritoneum combined with the peristalsis attendant upon digestion all play a part in making the prognosis more grave.

Anesthesia

For first-aid treatment it may be well to employ no anesthesia at all. In cases of hemorrhage, a spurting artery should be clamped. A gaping wound with oozing may be packed. A chest wound may be closed hurriedly to relieve asphyxia and the attendant suffocation. Measures of this nature may be undertaken with no anesthetic or a little novocaine while waiting for the operating room to be prepared. The choice of the anesthetic to be employed for the major exploration is ether, or nitrous oxide and ether. Ethylene has a slight tendency to increase hemorrhage and is, therefore, an anesthetic of second choice in any case where bleeding may be a factor. The attendant shock with its great fall in blood pressure makes spinal anesthesia a poor selection though this may be more theoretical than actual. Spinal anesthesia may only cause a farther drop in blood pressure and increase the manifestations of shock. For this reason I think it should be avoided though at times it may be indicated. I have had no personal experience with intravenous anesthetics in cases of this kind. Local infiltration may be employed if desired but it has the disadvantage of making a thorough exploration difficult or impossible and thorough exploration is always essential so that no perforation or injury to internal organs will be overlooked.

Hemorrhage

It is surprising how often a penetrating wound of the abdomen is accompanied by little or no hemorrhage (Cases 10 and 11) when one considers the number of large vessels which might be encountered. On the other hand perforation of any of the great abdominal vessels usually results in death before any surgical intervention can be employed. Hemorrhage in the mesenteric vessels is usually self-limited because a hematoma forms which of itself favors clotting and cessation. However, any actively bleeding vessel should be litigated and the bowel supplied should be watched for ten or fifteen minutes for viability. If it becomes apparent that the blood supply is impaired, resection must be performed. Hemorrhage from perforation of the spleen (Cases 9 and 13) or kidney (Cases 13 and 14) require splenectomy or nephrectomy. Perforations of the liver are practically impossible to suture and, as the organ cannot be removed, packing tightly with gauze is the procedure of choice.

Location of Wounds and Organs Involved

Chest.—A clear understanding of the physiology of respiration must be in mind in cases involving puncture wounds of the chest wall. Any wound of this character immediately destroys the negative pressure of the pleural cavity and causes a collapse of the lung. In cases of bilateral puncture the resulting pneumothoraces are dangerous in the extreme. Asphyxia and suffocation result from inability of the lung or lungs to expand and aerate the pulmonary circulation. In order to obviate this the chest cavity should be closed immediately by through-and-through sutures so that the pleural cavity is made air-tight. If there are still signs of asphyxia and suffocation, a needle should be inserted between the ribs (Case 5) and air aspirated in order to restore negative pressure and aid the lung in expanding. When, in a perforation of the chest wall, a pneumothorax is complicated by hematothorax (Cases 4 and 7), closure of the chest cavity is equally important in that the pressure of the blood in the closed cavity acts as a hemostatic and stops the bleeding. No attempt should be made to aspirate any fluid until convalescence is well under way (Cases 4 and 7). When the lung itself is lacerated, the case of course assumes much more serious proportions. This is usually evidenced by the appearance of pink frothy blood coming from the mouth. Tight closure of the chest wound and supportive measures in the form of intravenous medication and transfusions are in order. In cases involving the chest wall and diaphragm, the opening in the diaphragm must be closed (Case 9) and if it is detached from the chest wall it must be replaced if possible. I have had no personal experience with injuries to the heart and pericardium. However, cases are reported in the literature where suture of the cardiac musculature and pericardium have been successfully carried out.

The Gastro-Intestinal Tract. — Perforating wounds of the abdomen puncture the gastro-intestinal tract more frequently than any other one organ (Cases 9, 10, 13, 14, 15, 16, 17, 18 and 19). The number of perforations may vary from one or two to twenty or forty or more. A single bullet may cause a dozen or more while a shotgun charge may cause a very large number (Case 9). Immediate exploration is indicated through an incision fairly close to the midline. This is necessary because the perforations in the bowel may lie at a considerable distance from the site of entrance or exit of the bullet and it is advisable to make an incision through which the entire bowel may be examined. Usually the number of openings in the bowel are even in number (Cases 10, 16, 17 and 19), there being usually one exit wound for each entrance wound. If the number of perforations is uneven, careful search should be made for another (Case 16). Perforation may at times be hidden at the margin of the mesenteric attachment and only careful search will reveal it. If the number is still uneven, one should satisfy himself that one of the perforations is tangential (Case 15). If a single perforation is found in the ascending or descending colon, the parietal peritoneum should be incised and the posterior extra-peritoneal portion of the bowel should be examined. The openings should be closed with two layers of Dulox catgut, suturing transversely. The first layer through the mucosa should be an over-and-over running stitch which everts the mucosa. The second layer should be through the muscularis and serosa, using a Lembert suture. The higher in the tract that the perforations occur, the better the prognosis, as the danger of infection increases the farther the wound is from the stomach. Nasal suction should be employed routinely in all cases of perforation of the bowel or where infection is anticipated.

The Spleen.—When the spleen is perforated, splenectomy must be performed along with whatever other surgery is necessary (Cases 9 and 13). Due to the great vascularity of the spleen, much loss of blood and shock usually accompany the wound. Splenectomy usually is not very difficult. When unassociated with perforations of other organs, the prognosis is usually good, provided the patient is explored early.

The Kidneys.—Puncture wounds of one kidney are in about the same category as the spleen as far as procedure is concerned: That is, nephrectomy is indicated (Cases 13 and 14). This, however, requires that the nephrectomy be performed through an abdominal incision inasmuch as the abdominal cavity must be explored at the same time. However, after incision of the parietal peritoneum of the ascending or descending colon and displacing the large bowel medially, nephrectomy can usually be performed without a great deal of difficulty. Prognosis again depends on the amount of damage to other organs and the amount of blood lost.

The Liver.—Perforating wounds of the liver are always serious and the prognosis is always grave (Cases 4, 12, 17 and 19). In my series very few patients who have sustained this type of injury survived. The hemorrhage is usually great and the attendant technical difficulty of controlling it adds to the seriousness of the problem. Suturing is usually impossible and packing is the method of choice and this is usually inadequate. No doubt the factor of "liver shock" also plays a part in increasing the seriousness of the prognosis. Just what "liver shock" is, is not definitely understood, but it must be recognized as a clinical entity.

The Pancreas.—Injuries to the pancreas are also very dangerous. The inaccessibility of the organ for surgery and the necrosis which follows from the liberated pancreatic juice are the main reasons for mortality and a grave prognosis.

The Bladder.—Perforations of the bladder may at times tax one's surgical judgment. Signs of extravasation are usually present and the lack of return of urine on catheterization should lead one to be prepared. No hard and fast rule can be laid down as to procedure but perhaps the method of choice is tight closure of the bladder and postoperative insertion of an indwelling catheter. The prognosis depends on the amount of soiling, the time element and injuries to other organs.

Shock

The picture presented by these patients is usually one of extreme gravity (Cases 4 to 19). Although an occasional individual even when seriously injured may give the appearance of well-being, this is not the rule. There is usually extreme shock, characterized by pallor, cold perspiration, cyanosis, air hunger, a weak, thready, rapid pulse, and a low blood pressure. Therefore the patient must be treated for shock as well as for his injury. It is well to institute intravenous medication of saline with adrenalin during and even before the operation. Preparations for transfusion should be started immediately for administration during or after the operation. It is usually well to keep the patient in the operating room following the operation until the shock is overcome by supportive measures. Ephedrin and hot water bottles are indicated along with the intravenous treatment.

Infection

If the immediate dangers of shock are surmounted and the perforations repaired satisfactorily, the next concern is that of infection. (Cases 4, 9, 12, 15, 16, 17 and 20). Pneumonia, lung abscess, peritonitis, subdiaphragmatic abscess, and pelvic abscess are the commonest infections which may follow. With the advent of infection these are the locations where one should first look in an attempt to localize and treat the sepsis.

Case Reports

The following series of case reports on twenty-one patient illustrate many of the points made above. The case histories are abstracted very concisely and only the most salient points brought out.

A résumé of the mortality in this group of twenty-one cases reveals there were five deaths or approximately 24 per cent.

In Case 9 death resulted from multiple abscess in both the chest and the abdomen following forty perforations in the bowel due to a shotgun charge.

In Case 12, following a stab wound injury to the liver, subdiaphragmatic abscess, general peritonitis and pleural effusion were the cause of death.

In Case 14 death resulted in less than twenty-four hours probably from the shock from loss of blood as he had both hemoperitoneum and hemothorax.

In Case 17 the patient had a perforation of the liver, small bowel and large bowel. Death resulted from general peritonitis, pneumonia and one opening in the bowel in the retroperitoneal portion of the duodenum.

In Case 18 the patient died from the shock following the passage of an iron bar and clothing through his abdomen. In other words, this patient was killed by the accident rather than by complications.

Sliver of Wood in the Abdominal Wall

Case 1.—An eleven-year-old girl, while running, fell on a sliver of wood. It entered the abdominal wall just to the right of the umbilicus and proceeded in a downward direction. A wooden sliver, six inches long, entering the abdominal wall and extending into the right labia majora was removed. The abdominal cavity was not punctured. Uneventful convalescence.

Perforation in Gluteal Region

Case 2.—A 38-year-old man fell over a box and landed on a sharp branch of a tree. It penetrated the gluteus maximus. The patient's general condition was good and when the branch had been pulled out he was brought to the hospital. It was thought advisable to explore the tract because of the possibility of perforation into the pelvic or abdominal organs. On opening the tract it was found to extend only into the deep gluteal muscles. Uneventful convalescence.

Pitchfork Prong Through Wing of Ilium and Abdominal Wall

Case 3.—This thirty-five-year-old farmer slid from a stack of hay. A pitchfork had been placed prongs upward against the stack, and he was impaled on this. A prong entered the region of the right hip and perforated the wing of the ilium. The patient felt it go through the bone. The fork had been pulled out. Exploration revealed that the prong had perforated the wing of the ilium in an upward direction. It had penetrated the abdominal wall and grazed but did not perforate the cecum. Exploration revealed no puncture wound of any intra-abdominal organ. Uneventful convalescence.

Bullet Wound of Right Chest, Lung and Liver

Case 4.—A twenty-seven-year-old negro was shot by a "friend" through the right chest just below the nipple. The bullet had lodged in the right axillary region below the level of the nipple. There was some question whether the diaphragm and dome of the liver had not been seared by the bullet. The chest wound was closed. Hematothorax developed. The patient made a very slow convalescence, but after four months the chest began to clear. In eight months marked improvement was present and the patient was discharged. Twelve months after the accident the chest was normal on examination.

Eleven Stab Wounds

Case 5.—A thirty-year-old man was attacked while sleeping by an enraged manic-depressive relative. Eleven stab wounds were inflicted: three through the left chest wall, one through the right chest wall, two in the throat, one in the left eyelid, one in the ear, two in the wrist, one in the left lumbar region. The patient, when seen, was in extreme shock, gasping for air because of bilateral pneumothoraces. In the dressing room of the hospital the chest wounds were immediately sutured with through-and-through silkworm sutures. A needle on a large syringe was inserted between the ribs on both sides of the chest and air aspirated. Respirations improved, the gasping ceased and the patient was taken to the operating room where his other lacerations were repaired. Supportive intravenous medication was given. Uneventful convalescence.

Thirteen Stab Wounds

Case 6.—This patient was the wife of the patient in Case 5. When she discovered her husband being attacked by a man with a knife, she went to his aid. The maniac turned on her and inflicted thirteen stab wounds. They were located in the face, neck, nose, left lower leg, right medial thigh and arms. The patient was in extreme shock. Supportive measures were started and the stab wounds repaired. Uneventful convalescence.

Bullet Wound of Chest

Case 7.—A sixteen-year-old boy, suffering from asthma, shot himself with a .22 calibre gun. The bullet entered the left chest above the nipple and came out in the axillary line. He was brought to the hospital and did not look ill. His only complaint was slight pain in the chest. His wounds were merely dressed. The chest filled with fluid but nothing was done about it. In three months, x-rays revealed the complete absorption of the fluid and the chest apparently normal.

Bullet Wound of Chest and Lung

Case 8.—A sixteen-year-old boy was shot by a .38 calibre pistol bullet in the hands of an older brother. The bullet entered the left chest in the third interspace anteriorly and lodged beneath the skin in the sixth interspace posteriorly. He was in extreme shock, unconscious, and his pulse thready and skin cold and moist. There was subcutaneous emphysema of the chest wall. The wound of entrance of the bullet was closed. Supportive measures were instituted. The patient ran a stormy course but was much better in five days. The bullet was removed from the back one week after the accident. The patient was discharged three weeks later in good condition.

Shotgun Wound of Abdomen and Chest

Case 9.—This twenty-two-year-old man, with suicidal intent, placed the butt of a shotgun on the floor, leaned over the muzzle and reached down and pulled the trigger. The shot tore away the left upper quadrant of his abdomen and lower ribs and diaphragm. He was brought to the hospital gasping for breath because of a pneumothorax. The bowel was eviscerated. The patient was in shock. Supportive measures were instituted. Through the gaping wound the diaphragm was sutured to the lateral chest wall in a position higher than its normal attachment with through-and-through catgut sutures. Breathing immediately improved. The shredded ends of the tenth and eleventh ribs were removed. A splenectomy was performed. More than forty perforations of the large and small bowel were closed. The left kidney was not removed though shot could be felt in the capsule. A large retroperitoneal hemorrhage had occurred. The wound was closed as well as possible. For a time it seemed as though the patient might recover, but death occurred on the sixteenth postoperative day. The cause of death as reported at postmortem was: (1) local peritonitis; (2) sub-diaphragmatic abscess; (3) left empyema; (4) abscess of left lung; (5) multiple abscesses of left kidney.

It is interesting to speculate on how the defect in the abdominal wall could have been repaired had the patient recovered.

Bullet Wound Through Abdomen

Case 10.—This seventeen-year-old boy, while hunting, was struck by a .22 calibre bullet from a gun in the hands of a friend. The bullet perforated the sacrum and went through the abdomen, lodging in the skin of the anterior abdomen just lateral to the umbilicus. The patient was in shock. On exploration, ten perforations of the small bowel and four through the mesentery were found. The openings in the bowel were closed transversely with two layers of Dulox catgut. Supportive measures were instituted for shock. Uneventful convalescence.

Lacerations of Throat and Abdomen

Case 11.—A young man of twenty-eight years, grieving over the recent death of his wife, slashed his throat and abdomen six times with a razor. He was in extreme shock from loss of blood. Supportive measures were given. The lacerations in the throat, tongue and pharynx were repaired. Evisceration of the bowel had taken place through the abdominal lacerations, but it was not perforated. The bowel was replaced and the abdomen sutured. Uninterrupted convalescence.

Multiple Stab Wounds of Abdomen, Liver and Diaphragm

Case 12.—A twenty-nine-year-old man, while engaged in a drinking brawl, was stabbed by his brother. Three wounds of the abdomen were found, one each in the upper quadrants and one in the right lower. The one in the right upper quadrant had penetrated the liver and diaphragm and penetrated the chest. The wound in the liver was packed and the eviscerated bowel replaced. The patient died on the twelftfh postoperative day. The postmortem causes of death were: (1) stab wounds of abdomen, liver and diaphragm followed by general peritonitis and sub-diaphragmatic abscess; (2) pleurisy with effusion; (3) cloudy swelling of heart, liver and kidneys.

Bullet Wound of Abdomen Performing Spleen, Mesentery and Kidney

Case 13.—A nineteen-year-old clerk in a drug store was held up and shot in the abdomen by a bandit. The patient was in extreme shock. Supportive measures were instituted. The bullet had entered the abdomen in the left upper quadrant and lodged in the lumbar muscles. On exploration through a left rectus incision, it was found that the bullet had perforated the spleen, left kidney and transverse mesocolon. The spleen and kidney were removed and the rent in the mesocolon repaired. After three weeks the bullet was removed from the lumbar muscles. Uneventful convalescence.

Bullet Wound of Abdomen, Kidney and Diaphragm

Case 14.—This thirty-five-year-old man stated that he was rummaging through a tool chest in which was a loaded pistol. It accidentally discharged, striking him in the abdomen. A bullet wound just lateral to the umbilicus on the left was found. The bullet lodged in the skin in the left lower chest posteriorly. Exploration revealed four perforations of the small bowel, which were repaired, one in the transverse mesocolon and one through the left kidney. The kidney was removed after laying the descending colon medially. The patient's extreme shock was treated by supportive measures but he died within twenty-four hours. The postmortem causes of the death were: (1) gunshot wound of abdomen; (2) lacerations of small intestine and kidney; (3) hemoperitoneum; (4) hemothorax; (5) bilateral congestion and edema of the lung.

Bullet Wound of Abdomen

Case 15.—This eleven-year-old boy was shot through the abdomen by a .22 rifle in the hands of a playmate. The bullet entered the right lower quadrant of the abdomen and lodged in the region of the left acetabulum. On opening the abdomen much free blood was found. There were eleven intestinal perforations in all: three in the cecum, one tangential; six in the ileum; and two in the sigmoid. They were all closed transversely. The patient made a good convalescence in spite of an infected wound and was discharged in six weeks.

Bullet Wound of Abdomen

Case 16.—This twenty-six-year-old patient, while attempting to escape the police, was shot just lateral to the left sacro-iliac synchondrosis. The bullet lodged in the skin just to the left of the umbilicus. Exploration revealed a large retroperitoneal hemorrhage, two perforations of the jejunum at the ligament of Treitz and two of the stomach. These were closed. Retroperitoneal exploration did not reveal the bleeding artery. The kidney was not injured. The patient was transfused but died the next day. Postmortem revealed: (1) general peritonitis; (2) left lobar pneumonia; (3) cloudy swelling of the heart, liver and kidneys; (4) acute splenitis.

In this case only one hole was found at first in the jejunum, but on opening into the lesser peritoneal cavity the second was found, showing the value of looking for two holes.

Bullet Wound of Abdomen

Case 17.—This forty-year-old patient, while standing in a beer tavern, was shot by another man for "no reason at all." The bullet entered the right abdomen just below the ribs and lodged in the left hip. It perforated the liver, the ascending colon in two places, the ileum in six places and the sigmoid in two places. These were all closed by double-layered Dulox catgut. The liver was sutured with mattress sutures. Supportive measures failed and the patient died eight hours later. Postmortem causes of death were: (1) general peritonitis from gunshot wound; (2) bilateral bronchopneumonia; (3) congestion and edema of the lungs. One perforation of the retroperitoneal position of the duodenum just distal to the ampulla of Vater had been overlooked at operation.

Massive Perforation of Abdomen by an Iron Bar

Case 18.—This forty-three-year-old man was sleeping beneath a train. The train started and a broken truss rod, protruding from a box car, impinged upon his abdomen and pole-vaulted the car over his body. This iron bar, measuring 1x6x58 cms., was driven through his body in the left upper quadrant of the abdomen. It carried parts of his coat and shirt through with it. He was brought to the hospital with the bar protruding 8 or 10 cms. in front and back. Through a transverse incision from the midline of the abdomen to almost the spine in the back the bar and clothing were removed. The jejunum was completely severed in two places. These were repaired by end-to-end anastomoses. Several rents in the jejunum were also closed. A large rent in the mesocolon was repaired. The wound was closed and a transfusion was given immediately. He rallied well, but died within twenty-four hours.

The postmortem cause of death was: (1) puncture wound of abdominal wall, with multiple ruptures of the small intestine; (2) shock.

Multiple Bullet Wounds

Case 19.—In a gangland war, a man was shot through the abdomen four times in the right lower quadrant, four times through the right arm and once in the right hip. The patient was in shock. Supportive measures were instituted and the abdomen explored. Four perforations of the transverse colon were closed. The liver was slightly lacerated. This was packed. A retroperitoneal exploration revealed a large hematoma but no injury to the kidney. The patient made a slow but uninterrupted convalescence and fled the hospital on the fifty-eighth day after his injury.

Bullet Wound of Left Groin

Case 20.—This forty-three-year-old male, while attempting to flee after a burglary, was shot by a policeman. One bullet singed his hand and one struck him in the left groin. X-rays revealed the bullet lodged in the region of the left acetabulum. The patient began running a septic course, and eight days later exploration was made for the bullet, going between the sartorius muscle and the rectus femoris. The capsule of the hip joint was incised and about a tablespoonful of pus was evacuated. The bullet was removed from the posterior edge of the acetabulum. Convalescence was uncomplicated from then on.

Perforating Wound of Uterus

Case 21.—This thirty-five-year-old woman, in attempting an abortion upon herself, inserted a Couday catheter into the uterus. She perforated the dome and the catheter slipped away from her. She was brought to the hospital, three days later, with all the clinical signs of peritonitis. Exploration revealed a generalized peritonitis and the catheter was found wrapped in folds of the omentum. This was removed and the abdomen drained. The patient had a stormy convalescence but recovered and was discharged from the hospital on the twenty-third postoperative day.

NONCOMMUNICATING CYST OF THE SEPTUM PELLUCIDUM*

With Recovery Following Ventriculography

NATHANIEL J. BERKWITZ, M.D., Ph.D.
Minneapolis, Minnesota

IN THE seventeenth century Sylvius observed in several brains dilatation of the cavum septum pellucidum (fifth ventricle). Verga,[7] in 1851, discovered a cavity posterior to the cavum septum pellucidum which he suggested naming "the sixth ventricle," now known as the cavum vergæ. At the time no clinical significance was attached to these findings.

These two cavities are not always present. In thirty consecutive brains examined at the University of Rochester, Van Wagenen and Aird[6] report that dilatation of one sort or another of the septum pellucidum was demonstrated in eighteen, or 60 per cent. These writers believe that these two cavities are one embryologically, and only in chance variations are they found to develop separately. The cavities may become so distended by accumulation of fluid as to occlude the interventricular foramina and produce hydrocephalus and other neurological changes.

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*From the Division of Nervous and Mental Diseases, University of Minnesota. Read before the Central Neuropsychiatric Association meeting, Minneapolis, October 7, 1938.

By means of ventriculography, Dandy,[2] in 1931, was the first to make a clinical diagnosis of abnormal dilatation of the cavum septum pellucidum and cavum vergæ. He reported two cases in which the cavities were dilated to an abnormal degree, sufficiently to produce compression of the pyramidal tracts, and marked mental symptoms. He stated that ventriculograms, in such conditions, appear to be pathognomonic of congenital cysts of the cavum septum pellucidum and cavum vergæ, and that with operative treatment a permanent cure can probably be expected.

Van Wagenen and Aird suggest a practical classification of dilatations of the cavum septum pellucidum and cavum vergæ, namely: "(a) noncommunicating, or those that have not established a fistula into the third, or lateral ventricles; (b) communicating, or those that have a fistulous communication with the ventricular system; (c) secondary or acquired dilatation, communicating in type, where the dilatation is but a part of a superimposed internal hydrocephalus from whatever cause." The noncommunicating dilatations may cause such symptoms as are produced by tumors: mental changes, headaches, vomiting, motor paralysis, etc. Communicating dilatations do not produce clinical symptoms, since there is no pressure to occlude the interventricular foramina. Consequently, the conversion of a noncommunicating to a communicating dilatation by means of a fistulous opening relieves the patient and brings about a clinical recovery.

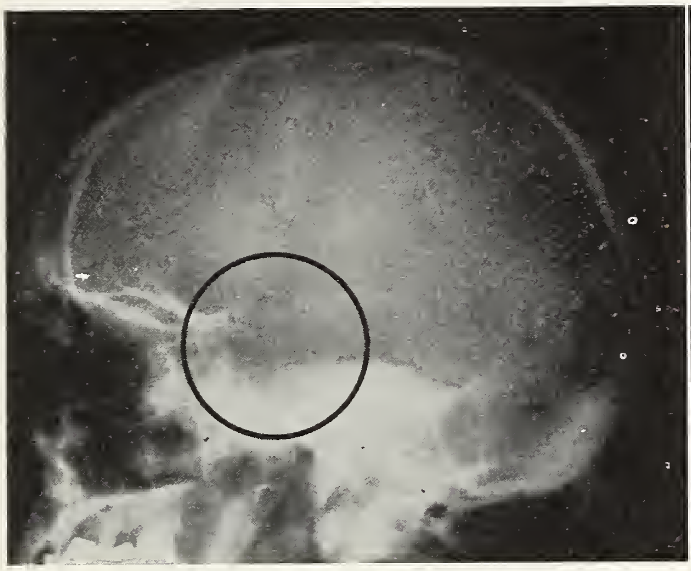

Fig. 1. Skull x-ray, November 14, 1931, showing decalcification of the dorsum sella, erosion of the floor, and enlargement of the fossa.

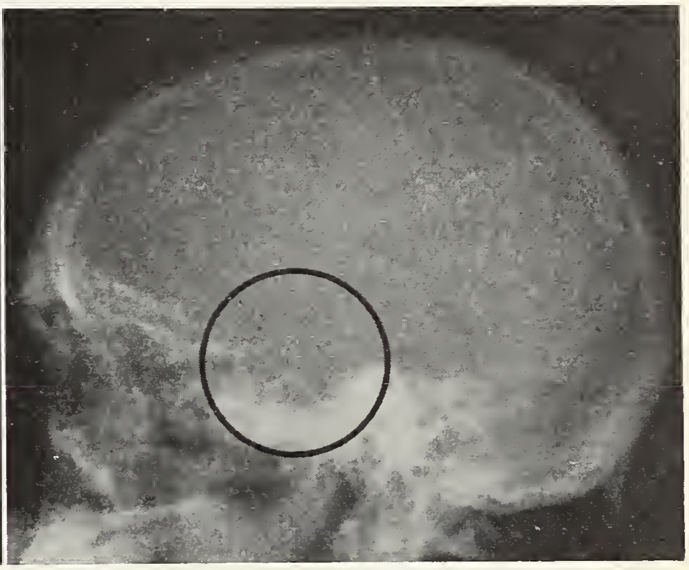

Fig. 2. Skull x-ray, October 31, 1936, showing new bone formation in the posterior clinoids and the clavus, and recalcification of the floor of the sella.

Report of Case

History.—H. K., male, aged thirty-eight, a successful traveling shoe salesman, enjoyed good health up to June, 1931. He first began to have numbness in the right hand, and a few weeks later developed a numbness in the right leg. Early in October a motor weakness appeared in the right extremities. The patient continued to grow worse, became forgetful, irritable, and emotionally unstable, crying and laughing for little or no apparent cause.

On November 1, 1931, the following essential neurological findings were noted: The eyegrounds and cranial nerves were normal, there was incoördination and motor weakness in the right extremities, the deep reflexes were increased, and the abdominal reflexes were decreased on the right. A spinal tap showed the pressure was elevated to 420 millimeters of water pressure. It was decided that he had a left frontal neoplasm and he was taken to a well known clinic for surgical treatment. At the clinic the symptoms continued to increase. He became confused, drowsy, incontinent, and was unable to walk. Skull x-rays showed marked erosion of the sella turcica. A diagnosis of tumor of the anterior corpus callosum was made and, since operative treatment was not recommended, he was discharged.

Examination.—The patient was transferred to the University Hospital, November 13, 1931, in a stuporous condition. He was confused and under the delusion that he had been in an automobile accident one week previous. During the examination he laughed frequently, talked loudly, exhibited Witzelsucht and showed marked paraphasia and motor apraxia. The general physical examination was essentially negative.

The temperature and pulse rate were normal; the blood pressure was 130/80.

Ophthalmoscopic examination revealed mild optic neuritis with engorgement of the retinal veins. Nystagmus was present on looking laterally. All the deep reflexes were increased, but more on the right side. The right abdominal reflexes were decreased, and the Babinski test was present on the right. The patient had coarse tremors of the hands, marked incoördination, and was unable to stand without support.

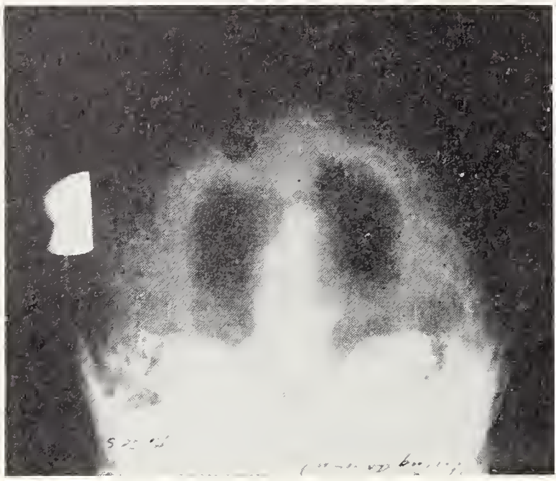

Fig. 3. Ventriculogram, November 17, 1931, anterior-posterior view. Supine roentgenogram showing dilatation of the lateral ventricles with a mass in the midline compressing and separating both ventricles.

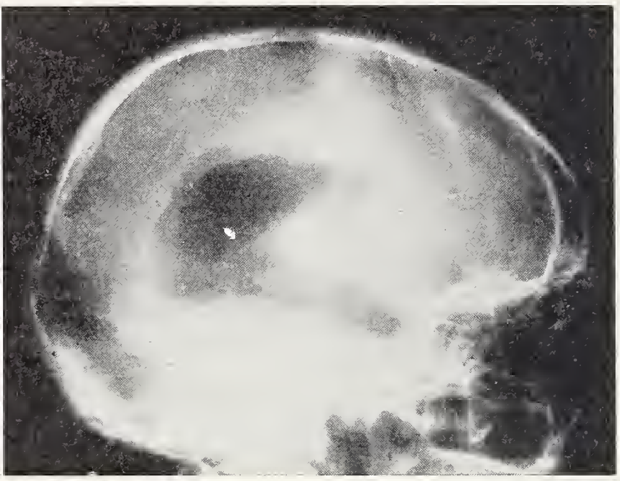

Fig. 4. Ventriculogram, November 17, 1931, right lateral view. Supine roentgenogram showing dilatation of both ventricles with poor filling of the anterior horns.

The blood and spinal fluid Wassermann tests were negative. The spinal fluid was clear, no cells were present and the Nonne test was negative. X-rays of the skull showed a marked thinning out of the posterior clinoid processes, and some irregularity and haziness in the floor of the sella and the neighboring portion of the middle cranial fossa.

Course in Hospital.—As a last resort, a ventriculography was performed by Dr. William Peyton, Head of the Neurosurgery Department, on November 17, 1931. The ventricular pressure was greatly increased; about eighty-five cubic centimeters of clear fluid was replaced by forty-five cubic centimeters of air in the left ventricle, and some methylene blue dye was injected. About thirty-five centimeters of clear fluid was removed from the right ventricle and replaced by twenty-five cubic centimeters of air. No methylene blue dye was recovered in the right ventricle, indicating the presence of a block between the lateral ventricles. The ventriculograms showed both ventricles were markedly enlarged. Instead of a narrow vertical space which normally represents the septum pellucidum, a large filling defect, 5 by 4.5 centimeters, was present.

For two days after the ventriculography the patient's condition remained the same. He tried to get out of bed frequently and to tear the bandage off his head. The third day (November 19) he appeared brighter and less confused. On the sixth day (November 22) he became more rational, cheerful, and coöperative; and on the tenth day (November 27), the day he left the hospital, he was able to walk, feed himself, and talk rationally.

From the ventriculograms, at first a tumor rather than a cyst of the septum pellucidum was considered and two series of eight deep x-ray treatments were given to the head from November 22 to December 7, 1931, and from January 27 to February 15, 1932. Since there was such a definite improvement even before the first x-ray treatment, and since very little, if any, improvement can be expected from deep x-ray treatments for at least two or three weeks, it is beyond all reasonable doubt that the x-ray treatment was not responsible for the rapid recovery.

Since leaving the hospital the patient has enjoyed good health. He returned to his occupation and is working regularly and efficiently. On October 31, 1936 (five years after he left the hospital) x-rays of the skull were retaken. They showed that the floor of the sella remained somewhat deepened and larger than normal, but instead of erosion of the sella turcica there was a considerable filling in of bone, especially in the posterior clinoids and clavus.

Comment

Noncommunicating cysts of the septum pellucidum have been treated successfully by rupturing the cyst wall and producing a fistula into the lateral ventricles. This operation has been performed successfully by Dandy, Van Wagenen and Aird, Tönnis,[5] and Kötter[3] by a transcorpus callosal or a transventricular approach.

Van Wagenen and Aird suggest a less radical procedure be tried first, namely, making a burr hole opening over the right precentral area under a fluoroscope if necessary, tapping the noncommunicating dilatation one or more times with a brain needle, going through an air-filled ventricle.

It is possible for the cyst to rupture spontaneously, since the walls are very thin. Artificial openings between the cysts of the septum pellucidum and the lateral ventricles have been found in autopsied specimens.[2] Two cases have been reported by Van Wagenen and Aird, and Laubenthal,[4] in which they believe communicating cysts were brought about by spontaneous rupture of the cyst wall. Van Wagenen and Aird's case was that of a man, aged thirty-nine years, who had mental symptoms and attacks of unconsciousness. The only neurological findings were a convergence of the right eye and a questionable positive Romberg. The patient recovered after encephalograms were made. The encephalograms showed air in the cavum septum pellucidum which they believe gained entrance through spontaneous rupture of the cyst wall by sudden changes in the intraventricular pressure at the time of the encephalography. They state that Stookey reports a similar experience which leads him to believe that the walls of a septal dilatation were ruptured at the time of an encephalography.

Laubenthal's case was that of a child who developed many neurological findings, and then improved without treatment. Ventriculograms were not made until after the child's condition improved, and these showed a large communicating cyst of the septum pellucidum. Laubenthal believed that the walls of a communicating cyst ruptured spontaneouly, and recovery took place without medical treatment.

The case reported in this paper apparently is also that of the transformation of a noncommunicating into a communicating cyst. The clinical symptoms appeared approximately six months before ventriculography was performed. The clinical picture, consisting of mental disturbances, motor paralysis, drowsiness and motor apraxia with increased cerebrospinal fluid pressure, is characteristic of the corpus callosum syndrome described by Alpers and Grant.[1] The cyst apparently did not rupture immediately, since no air entered the septum pellucidum at the time of the ventriculography. Whether sudden changes of the interventricular pressure, or irritation of air injected was responsible for the rupture of the septal wall cannot be determined, but the rapid improvement immediately following the ventriculography with no recurrence of symptoms after seven years leads the writer to believe that a noncommunicating cyst of the septum pellucidum was ruptured. By repeating the pneumography, positive proof of this diagnosis could be established beyond doubt. The patient refused to give permission for this, but the history, the findings, and the remarkable recovery support the writer's conclusion.

Conclusion

1. Noncommunicating dilatations of the cavity septum pellucidum and cavum vergæ may cause clinical symptoms similar to corpus callosum tumors.
2. The diagnosis may be suspected clinically, but must be confirmed by means of pneumography.
3. The treatment is to convert the cyst into a communicating dilatation by opening it into the ventricular system. Three clinical cases have been reported in the literature where rupture of the walls occurred spontaneously. The writer presents a fourth case. In this case complete clinical recovery followed ventriculography.

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7. Verga: Quoted by Dandy.[2]

Self-Protected—Few physicians die of tuberculosis despite the fact that they are constantly exposed to it. Knowledge defends them as it may yet defend other groups in the population when properly educated in self-protection.

◆ CASE REPORTS ◆

TERMINAL ILEITIS WITH EXTENSION INTO THE CECUM FOLLOWING NONPERFORATING ABDOMINAL TRAUMA

J. S. BLUMENTHAL, M.D., and REUBEN BERMAN, M.D.

Minneapolis, Minnesota

INTEREST in localized areas of chronic inflammation of the small bowel was revived in 1932 by Crohn, Ginsburg and Oppenheimer.[2] These writers named the condition "regional ileitis" although most of their cases conformed to the designation "terminal ileitis." Subsequent studies have demonstrated similar lesions elsewhere in the small bowel and in the colon as well.[3, 4] Etiological factors suggested include tuberculosis, peritonitis from various sources, syphilis, low grade bacterial infection. Inflammatory stenosis of the bowel following abdominal trauma is well known.[5,11] We have, however, found no reports in recent medical literature of blunt non-perforating trauma as the cause of the type of intestinal pathology described by Crohn and his associates.

Bowel injuries from non-perforating abdominal trauma are of great surgical and medico-legal interest. Such injuries are not rare. The injury to the bowel wall may be mild, consisting only in a tear through mucosa or serosa, or severe enough to sever completely the bowel, spilling intestinal contents into the peritoneal cavity. Bruising of the bowel wall with hemorrhage but no actual rent of the bowel may occur. The site of injury may be anywhere in the gastrointestinal tract. Ruptures of the stomach,[5] duodenum,[11] small intestine,[10] appendix,[9] and large intestine[1] have been reported. The terminal ileum lying relatively close to the abdominal wall and partially obstructed by the ileocecal valve is peculiarly vulnerable to trauma. A wave motion set up in the liquid contents of the bowel by a violent blow may rebound from the valve and cause a summation of forces in the terminal ileum. The perforation may occur hours or days following the trauma.[6]

This report deals with a patient in whom terminal ileitis with extension of the inflammation into the cecum developed following blunt trauma to the abdominal wall.

The patient is a white man, twenty-four years old, injured July 6, 1937. His past history is distinguished by many years of uninterrupted good health. Throughout grade and high school he did not miss a day because of illness. He took no sick leave in six years of work. As a child he had measles, epidemic parotitis, pertussis. He uses no liquor or tobacco. His parents, four brothers and three sisters, are living and well. One brother died at eighteen years of Hodgkin's disease. He is married and has three sons, all well. The injury occurred while he and an assistant were lifting empty wooden crates weighing 35 pounds onto a warehouse truck. In raising one of the crates they failed to clear the pile of boxes on the truck and the crate dropped, striking the patient in the right lower quadrant of the abdomen. He suffered immediate severe pain in the region and was incapacitated for work the remainder of the day. The pain lasted about ten minutes and he then was able to go to his car unassisted and drive home. At no time was he unconscious. In spite of pain of short duration recurring every few hours he returned to work the following day. These pains continued until his first operation. He consulted one of us (J. S. B.), on July 15, 1937, because of the pain in the right lower quadrant. At the first examination the only positive finding was a partially absorbed hematoma 3 cm. in diameter located at McBurney's point. Stool examination revealed no occult blood, the urine was negative, white blood count 7,500. On July 19 he was awakened early in the morning with severe pain in the right lower quadrant which soon became intolerable. His temperature was 102 F., pulse rapid and thready, WBC 12,500, urine negative. Acute appendicitis appeared to be the most likely condition and the patient was operated upon later that morning at the University of Minnesota Hospital. A normal appearing appendix was removed. The cecum was normal. Further exploration revealed inflammation of the terminal ten centimeters of the ileum. In this region the bowel was thickened, reddened, and indurated. The lesion included the superior surface and extended around half the bowel circumference. No stenosis and no perforation was found. Peritoneal cultures were taken and with no further ado the abdomen was closed. The cultures were negative. After a rather stormy postoperative course of eighteen days he was discharged with a profusely draining purulent wound. Gastro-intestinal x-ray studies were done September 1, 1937, at the University Hospital. These showed narrowing of the terminal seven centimeters of ileum with a sinus tract extending medially and inferiorly 4 cm. from the midportion of the lesion. The patient continued to have recurrent abdominal pain. Another gastrointestinal study on January 18, 1938, showed a classical "string" sign in the terminal nine centimeters of ileum plus a ragged filling defect occupying the medial inferior portion of the cecum (Fig. 1). A two-stage resection of the distal ileum, cecum and ascending colon was undertaken by Dr. A. W. Hoaglund. At the first stage, January 20, 1938, the terminal ten centimeters of ileum was thick, red and firm. The cecum was less mobile than normal and its medial wall was thickened and hard. The entire ascending colon appeared to be redder than normal. The ileum was divided about 40 cm. from the cecum, the cut ends closed, and a side-to-side anastomosis performed from ileum to transverse colon. Following this operation the patient had an uneventful immediate course but after two weeks began again to have abdominal pain, now aggravated by diarrhea. On March 4, 1938, the abdomen was reopened and the short circuited terminal ileum, cecum, and ascending colon were removed. At this time the mass in the cecum was smaller and the colon more normally mobile. The ascending colon had lost its inflammatory appearance. The patient's immediate recovery was without incident but he has continued to have diarrhea with recurrent attacks of fever of 100 to 102 F. He has not recovered to the point where he can return to work. Careful microscopic and bacteriologic examinations of the diarrheic stools failed to reveal amebæ or B. dysenteriæ. Blood Wassermann tests were negative. The Mantoux test was negative. The patient's claim for compensation on the basis of trauma was allowed by the insurance company.

The operative specimen removed March 4, 1938, consisting of terminal ileum, cecum and ascending colon, was examined by Dr. N. H. Lufkin. The ileum measures 33 cm. from ileocecal valve to the point of amputation. There are a number of old adhesions at the site of the removed appendix. The segment of colon measures 20 cm. along the mesenteric border. The serosal surfaces of both colon and ileum are greatly roughened by recent but definitely fibrous adhesions. These are red and injected. No fibrin is found. The walls of the small intestine feel indefinitely thickened, but the colon on palpation seems normal. In the posterior portion of the cecum on the mesenteric border and within the mesentery are a number of moderately enlarged fairly soft lymph nodes. After fixation the bowel is divided along the antimesenteric border. The ileum seems normal except for increased thickness. Two centimeters from the valve the ileum becomes extraordinarily indurated although the lumen of the bowel is not reduced in caliber. The extreme induration extends to include the orifice of the ileocecal valve. The lips of the valve are extremely rigid with the effective orifice consisting of a slit 12 mm. long and 2 to 3 mm. wide. The stenosis is of a high degree and because of the rigidity incapable of distension. The inverted appendiceal stump is found at a point 2 cm. from the ileocecal valve. In this region the mucous membrane is hypertrophic and verrucous. On the side of the cecum opposite to the valve the mucosa is thickened and indurated, with many closely placed verrucous projections. The margins of the indurated cecum blend gradually into normal bowel distally. The bowel beyond 3 cm. from the ileocecal valve appears entirely normal.

Microscopic.—Sections from the ileum at a distance from the cecum show no changes from normal. Sections of ileum near the ileocecal valve show normal mucosa and muscularis mucosæ. The submucous connective tissues are considerably thicker and more fibrous than normal and there are focal infiltrations of lymphocytes in this layer associated with mild definite active proliferation of the connective tissue cells. The muscular coat is not thickened and practically free of inflammation. The serosa is normal. At a point still closer to the valve the mucosal coat of the ileum is definitely atrophic. The muscularis mucosæ is indistinct and there is extreme fibrosis of the submucous layer. There are large foci of lymphocytes which do not appear to be Peyer's patches. There are also scattered polymorphonuclears, plasma cells and eosinophiles. The muscularis here is greatly thickened, apparently by simple hypertrophy. The serosal coat is likewise thickened and contains dense lymphocytic foci. Sections from the more normal portions of the cecum show no particular changes. In a thickened portion there is some muscular hypertrophy with considerable edema between the muscle coats. This is associated with scattered infiltration of lymphocytes and plasma cells with a few polymorphonuclears. There are small areas of active proliferative changes on the part of the connective tissues but these are not especially conspicuous. Sections from the ileocecal valve and surrounding tissues show marked hypertrophy of the mucosa with the formation of small papillary structures. There is marked increase in submucous fibrosis with numerous perivascular foci of lymphocytes. Lymphoid follicles are extraordinarily conspicuous. There are a few fairly well circumscribed foci of proliferative inflammation associated with giant cells. These lesions do not resemble those of tuberculosis. In the serosal coats there is somewhat less fibrosis than in other sections but dense perivascular foci of lymphocytes are frequent. The lymph nodes show conspicuous lymphoid follicles at the periphery and increase of lymphocytes throughout. There is no evidence of immaturity of the lymphocytes. Polymorphonuclears and plasma cells are unusually numerous throughout the lymph nodes.

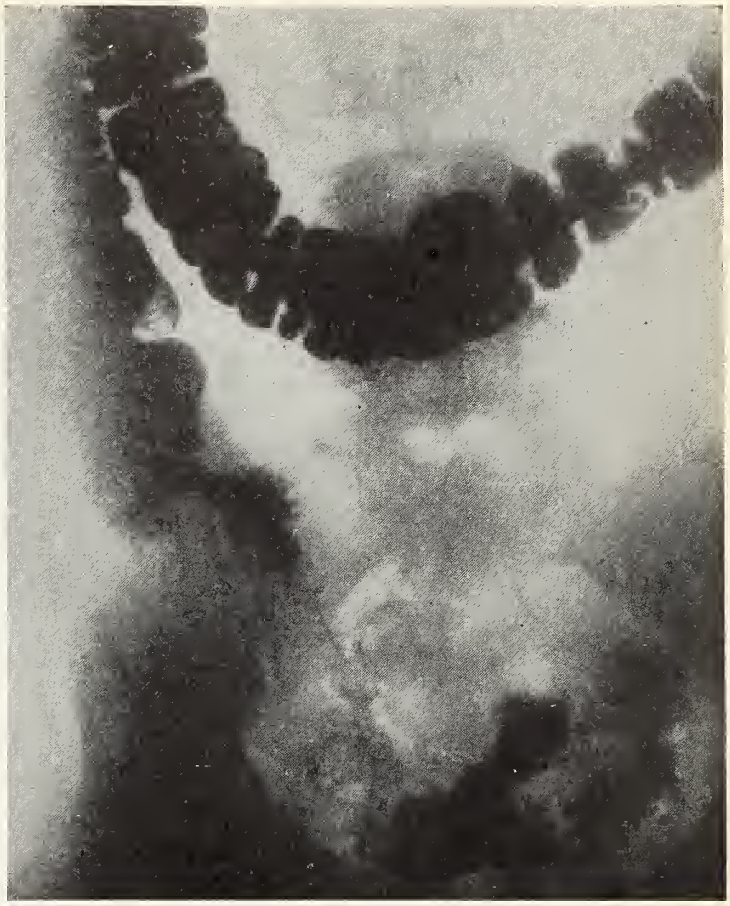

Fig. 1. Gastro-intestinal study of January 18, 1938. Plate taken at five hours showing narrowing of terminal ileum and ragged filling defect of medial inferior margin of the cecum.

Diagnosis.—1. Terminal ileitis with extension into the ileocecal valve and cecum.

2. Chronic stenosis of the ileocecal valve with partial obstruction of the ileum.

3. Hyperplastic mesenteric lymphadenitis.

Discussion.—The pathological appearance of the lesion in the ileum is that of a terminal ileitis. Other etiological factors of stenosis such as tuberculosis, amœbic dysentery, and syphilis, have been ruled out. From the serial roentgen examinations this lesion appears to be primary and the later picture of inflammation in the cecum can best be explained as an extension of the process. It is impossible to prove that the trauma actually caused the lesion. But the evidence in this case favors trauma as the etiological agent. The severity of the injury is attested by the large hematoma in the right lower quadrant over the site of the lesion. There were no symptoms up to the moment of injury, and from that moment on the patient has suffered the symptoms characteristic of this disease.

Summary.—A case of terminal ileitis with extension into the cecum is reported. The distal ileum and proximal colon were excised. The symptoms were initiated by blunt trauma to the abdomen.

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DIVERTICULA OF THE STOMACH

WALTER HALLORAN, M.D.

Jackson, Minnesota

DIVERTICULA of the stomach are rare. Among all portions of the digestive tract the stomach is the rarest location of diverticular formations. They are usually found near the cardia, less frequently near the pylorus, while those of the median portion of the stomach along the greater curvature are even less frequently seen.

The following case is reported.

The patient is a woman of fifty-four. Aside from the fact that she had had chronic bronchitis for the past fourteen years and slight attacks of gaseous eructations, there was nothing unusual in her history before May, 1935, when she had an attack of abdominal pain and jaundice which lasted for a few days and subsided. In September of the same year she suffered another attack and was first seen by us. At that time she had been ill for four days with abdominal pain, intermittent in character and very severe, mostly located to the left of the midline. This was associated with vomiting of large amounts which persisted until time of admission. Two months previously she had had right upper abdominal pain, more steady in character and associated with jaundice but no vomiting, which lasted for a few days. She had lost twenty-five pounds during the past two months.

The patient complained of feeling tired and weak, moderate abdominal pain, and said that she had been vomiting all food for the past two days. There were course râles over both lungs. The abdomen showed moderate general tenderness and the liver edge extended about three fingers breadth below the costal margin. There was a smooth rounded mass about the size of a small orange in the right hypochondrium which appeared to be attached to the liver. Otherwise the physical findings were essentially negative. There was no jaundice. The temperature ranged from subnormal in the morning to 99.5 in the afternoon. The pulse was 75, respirations 20, blood pressure 120/70, and the urine showed a faint trace of albumin. The leukocyte count was 10,000. X-rays of the gallbladder showed no filling. A diagnosis of cholecystitis was made. She left the hospital after four days much improved and was to return in ten days for operation. The patient, however, did not return until one year later, when she was brought in acutely ill. About a week before admission she had become acutely ill with a cough, elevation of temperature, and a dull pain in back and abdomen. She noticed that she was jaundiced first the day before admission. She had vomited several times a day for the past two or three days, rather large amounts, and had a chill the day of admission. There was marked icterus, the skin and tongue were dry, temperature 103, pulse 140, respirations 48. She was coughing a great deal and expectorating thick yellow sputum. There were coarse râles over both lungs but no areas of consolidation. The heart was rapid but otherwise normal. A tender, smooth, rounded mass could be felt in the right upper abdomen. Leukocytes numbered 26,000; the urine contained bile and a faint trace of albumin. With forced fluids and ice to the abdomen her condition improved and the jaundice cleared up and the temperature became normal. However, she was still coughing a great deal and the mass in the right upper quadrant persisted. Because of the pulmonary condition it was decided to do a cholecystotomy only.

On opening the abdomen the liver was three fingers breadth below the costal margin with a thickened rounded edge. A smooth mass was attached to the edge and under surface of the liver in the usual location of the gallbladder. It was pink in color and about the size of a hen's egg and covered by omental adhesions. It was densely adherent to the under surface of the liver and gallbladder and was connected to the anterior and upper aspect of the stomach at the pylorus by a pedicle about 2 cm. in length and the size of a lead pencil. The sac was aspirated and contained a thin chylous fluid. It could be compressed slowly. No effort was made to dissect the mass from the liver, but it was resected leaving that portion attached. The wall was about 0.5 cm. in thickness and lined by mucous membrane. There was no connection between the interior of the sac and the gallbladder. The pedicle was ligated at the gastric end and the stump inverted. The gallbladder was contracted and thick walled. There were no stones in the gallbladder or ducts. The gallbladder was drained. She had an uneventful convalescence and left the hospital on the fifteenth day. It was evidently a true diverticulum of the stomach which had become attached to the liver and gave rise to the symptoms simulating cholecystitis.

HISTORY OF MEDICINE IN RAMSEY COUNTY

BY J. M. ARMSTRONG, M.D.

(Continued from May issue)

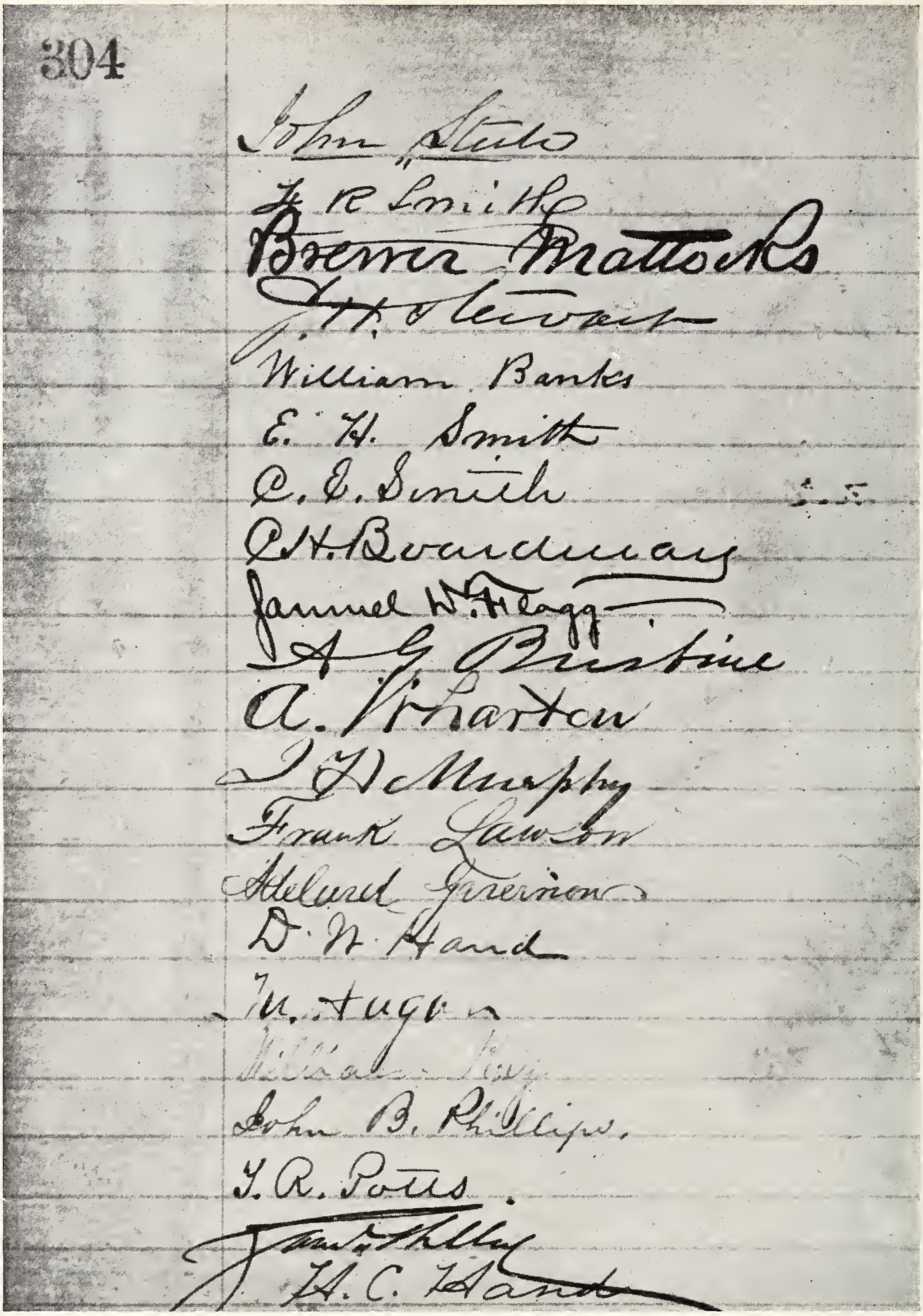
The Ramsey County Medical Society

Meetings of an informal nature among physicians had been held in Saint Paul since the dissolution of the Saint Paul Academy of Medicine and Surgery in 1866, but no formal organization was attempted. The constitution of the State Society of 1869 demanded the organization of county societies. Those of our local physicians who took the initiative in the formation of the Society were Dr. Charles H. Boardman and Dr. E. Hermann Smith, apparently at the instigation of Dr. Samuel Willey. On February 14, 1870, eleven physicians met in Doctor Smith's office and formed the Ramsey County Medical Society. Doctor Willey acted as temporary chairman, and the following officers were elected:

Daniel W. Hand—President
Alfred Wharton—Vive President
William Banks—Corresponding Secretary
Chas. H. Boardman—Recording Secretary
Samuel D. Flagg—Treasurer

After some discussion, the present name of the Society was adopted, it not being thought advisable to revive the older organization. Drs. Flagg, Banks, and Lawson were appointed a committee to draft a constitution and by-laws, and the Society adjourned to meet one week later. At this second meeting, twelve members signed the constitution, and the secretary was instructed to secure the signatures of other physicians who wished to join. After the following meeting, it was agreed that further additions to membership should be by ballot. The signatures of twenty-two men were obtained before the third meeting. These men are regarded as the founders of the society. The first member admitted by ballot was Dr. Alexander J. Stone, who came to Saint Paul from Stillwater early in the year. The next members were Drs. Charles Hill and William W. Mayo. Both of these men were elected to the State Legislature in 1872, and practiced medicine in Saint Paul as partners during their term of office. In 1873, Doctor Hill returned to Pine Island, and Doctor Mayo to Rochester, where both remained till their deaths. The names of the founders and the order in which they signed the constitution are: William Baldwin, David Day, John Steele, F. R. Smith, Brewer Mattocks, J. H. Stewart, William Banks, E. H. Smith, C. E. Smith, C. H. Boardman, S. D. Flagg, A. G. Brisbine, A. Wharton, J. H. Murphy, Frank Lawson, Adelard Guernon, D. W. Hand, M. Hagan, William Ray, John B. Phillips, T. R. Potts, and Samuel Willey. The Society has portraits of these men, but they were taken at a later date than the year of the founding.

For the first two years of its career the society was in a flourishing condition. Then evidence of decay became apparent, and at the end of its fifth year it practically ceased to exist. After four years of inactivity it was revived in 1879, and



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John Steele
F. R. Smith
Brewer Mattocks
J. H. Stewart
William Banks
E. H. Smith
C. E. Smith
C. H. Boardman
Samuel W. Flagg
A. G. Brisbine
A. Wharton
J. H. Murphy
Frank Lawton
Adelard Guernon
D. W. Hand
M. Hugo
[illegible]
John B. Phillips.
T. R. Potts.
Jams Kelley
H. C. Hand

Signatures of members who signed the Constitution.

flourished till 1882 when meetings were fewer and less well attended till 1889. A revival then occurred and the Society had been successful ever since, though there were periods until the year 1900 when attendance at the meetings was smaller than it should have been. Up to the beginning of this century the total number of those admitted was 261, the largest number having been added in 1884 when twenty-three new members were admitted. In 1900, the members numbered 135. At the present time the membership is about three hundred.

The minutes of the Society from the beginning reveal that the meetings were harmonious with but few exceptions. Many interesting papers were presented and intelligent discussion followed the papers and cases presented. At first, the meetings were held in the physicians' offices, and later in the rooms of the Saint Paul Medical School and in various hotels. In 1896, the Society secured rooms on the third floor of the old Lowry Arcade Building which also housed the beginning of the Society library and a laboratory. These rooms were occupied till the present Lowry Building was erected in 1912. Space for the Society's activities was then provided on the thirteenth floor. This was another step in advance and these rooms were occupied till the completion of the new Lowry Medical Arts Building, when the present adequate and attractive quarters were occupied in December, 1930, for which the Society, for the third time, is indebted to the owners of the building.

Among those who have attained prominence in medicine the following* may be mentioned:

1870-1880

Drs. Samuel Willey, Daniel W. Hand, Franklin R. Smith, Chas. E. Smith, Alexander J. Stone, Samuel D. Flagg, John H. Murphy, Alfred Wharton, J. H. Stewart, Francis Atwood.

1880-1890

Drs. Charles A. Wheaton, Edouard Boeckmann, Arthur B. Ancker, Everton J. Abbott, Justus Ohage, Gottried Stamm, Frederick Dedolph, John F. Fulton, Cornelius Williams, James A. Quinn, Jay Owens, Wm. Davis, Anton Shimonek, Perry H. Millard, Talbot Jones, Daniel Leasure, C. Eugene Riggs, Albert E. Senkler, Parks Ritchie, James Davenport, Chas. B. Witherle.

1890-1900

Drs. Arnold Schwyzer, Arthur Sweeney, Henry J. O'Brien, H. L. Nippert, Charles Lyman Greene, H. Longstreet Taylor, Jacob E. Schadle, Archibald MacLaren, Burnside Foster, John L. Rothrock, James S. Gilfillan, Arthur J. Gillette, Warren A. Dennis, E. W. Buckley, A. R. Colvin, Harry P. Ritchie, Gustave A. Renz, Geo. E. Senkler, Haldor Snévé, Thomas McDavitt, John T. Rogers, Walter Ramsey, James T. Christison, John B. Brimhall, Robert O. Earl, Erik M. Lindholm.

The reader will note that the names of none who came later than the year 1900 are included. In addition, may be mentioned Dr. Harry C. Hand who first brought a knowledge of microscopic pathology to Minnesota and who is quoted in Gray's Anatomy (6th edition) for observations on the anomalies of the cardiac valves; Dr. Justus Ohage who performed the first cholecystectomy in this country in 1886; and Dr. Anton Shimonek, who first brought here a knowledge of bacteriologic technic and claimed to have performed the first interval operation for appendicitis in the United States. Of those who had some distinction in other activities may be mentioned Dr. Daniel Leasure, who was a Brigadier General of Volunteers in the Civil War; Dr. Percy Vittum, who wrote a very pleasant little book of poems; Dr. Henry F. Hoyt, the author of an interesting autobiography under the title, "A Frontier Doctor"; Dr. Egil Boeckmann who has served for eight years as Regent of our State University; and Dr. Charles B. Witherle, who after leaving here became professor of nervous and mental diseases in the University of Maine, and Dr. Edouard Boeckmann, who designed the first steam pressure sterilizer.

Laboratory of the Ramsey County Medical Society

With the advent of Dr. H. C. Hand in 1871, the interest in both gross and microscopic pathologic anatomy began to play an important part in the meetings of the Society, and Doctor Flagg in his annual presidential address in 1872 touched on the desirability of establishing a museum for the preservation of interesting pathologic specimens. In 1889, a Pathological Section of the Society was formed and preservation of specimens was begun. In 1896, when the rooms in the Lowry Arcade were obtained, a pathologic laboratory was established for the use of the members. This section of the Society was a very active one for some years, under the supervision of Drs. Hallowell, Renz, Shimonek, and Rothrock. When the laboratory of the Department of Health was established and the various hospitals put in laboratories, the need for the Ramsey County Society laboratory was not so urgent and it fell into more and more disuse. Finally, when the Society rooms were removed in 1913 the laboratory was abandoned as it was then little used and had served its purpose. The remaining specimens of the collection were presented to the laboratory of the Department of Health. While this laboratory section of the Society existed it was of great utility to the members, and an activity which few county medical societies possessed at that time.

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*The names are arranged in the decade in which they came to Saint Paul.

Laboratory for Making Catgut Ligatures

In speaking above of the pathological laboratory, no mention was made as to how funds were provided to maintain it during its later years. Dr. Edouard Boeckmann had perfected a method of preparing catgut for surgical ligatures for his own use, and as the product soon began to be used by other surgeons, both here and elsewhere, he generously turned over the manufacturing and sale of it to the laboratory committee in order that the laboratory might be financed. All these years, the Society has continued to prepare and sell pyoctanin catgut which has been and is now widely used by surgeons throughout the country. With the abandoning of the pathological laboratory the profits accumulating from this activity now form the principle part of our building fund.

The Saint Paul Medical Journal

The proceedings of our Society may be found in the *Northwestern Medical and Surgical Journal* during the life of that journal, from 1870 to 1874, and from 1881 to 1899 in the *Northwestern Lancet.* At the annual meeting of the Ramsey County Medical Society in January, 1898, it was moved that a committee of five be appointed to consider the advisability of the Ramsey County Medical Society controlling its own medical journal, and to report at a future meeting. In October, 1898, the committee made a lengthy report which ended with the following recommendation: "First, That the committee are of the opinion that the Society should publish a monthly journal, the first number to be issued January, 1899. Second, That the committee recommend that the publication for the first year be delegated to the Committee on Publication with full power to act, with the understanding that the said committee assume all financial liabilities whatsoever."

There was considerable opposition manifested during the discussion following this report, but it was adopted by a small majority. The *Saint Paul Medical Journal* made its appearance in January, 1899, and in November, 1899, was made the official organ of the Society. Although the name of Dr. Edouard Boeckmann does not appear in connection with the starting of the journal, one may state that the idea of starting it originated with him and it was he who agreed to finance it for its initial year.

The *Saint Paul Medical Journal* was a success both financially and scientifically from its beginning till its demise in 1917, when the State Association began the publication of *Minnesota Medicine.* In order to consolidate the medical activities of the state the Saint Paul journal withdrew and offered its resources to the State Association. To those of the Society whose membership began after this journal ceased publication, I suggest that a perusal of it would be profitable and instructive. Dr. Burnside Foster edited the journal and ably conducted it till the time of his death. His editorials may be read with profit today, and no doubt had a great influence in promoting ethical medicine and raising the standard of medical journalism in the United States. Dr. H. Longstreet Taylor was the first business manager, and ably coöperated with Doctor Foster in making the journal a success. Members of the Society received the journal gratis. But few county medical societies then or since have had the temerity to publish a journal of their own.

Library of the Ramsey County Medical Society

For a number of years, the library was supported by voluntary subscriptions. After the *Northwestern Lancet* moved to Minneapolis the exchanges of that journal ceased to come to the library. In 1899, they were replaced by the exchanges of the *Saint Paul Medical Journal.* An annual appropriation for the library was made by the laboratory committee from its profits, and also from the profits of the *Saint Paul Medical Journal.* After the demise of the *Saint Paul Medical Journal,* the burden of supporting the library was born by the laboratory committee with a small appropriation from the Society's funds. The library now receives part of the exchanges from *Minnesota Medicine.*

The library has prospered exceedingly well, but like every similar institution it has always been in need of more funds as its activities expanded. Finally, in 1929, the Society realized that permanent adequate financial provision must be made for its support. In addition to the small annual contribution from the Society an annual appropriation from the income of the building fund of the Society was set aside for this purpose, and at the same time friends of the Society contributed nine memorial funds for deceased members. These latter funds have enabled the library to purchase books and to complete files of periodicals for which the funds of the Society were inadequate. The library keeps on file the important medical journals of the world and many society transactions, and endeavors to purchase any new books of merit which cannot be secured by other means. Many individual members of the Society and others, too numerous to mention here, have contributed books and journals. The library, since the autumn of 1929, has been under the administration of Miss Isabella T. Anderson, a trained librarian, and much progress has been made since then in cataloging and making accessible much material difficult to locate previous to that time. In addition to the library there is also housed in our rooms an extensive collection of antique and obsolete medical and surgical instruments and appliances which make an extremely interesting and instructive display. This collection was initiated during the presidency of Dr. Wallace H. Cole. Practically all this collection has been donated by Society members. The library also is attempting to form an historical collection of important medical books. Since funds are limited for this purpose the committee has largely confined its efforts in this direction to Medical Americana, and up to date has been fairly successful in this effort.

Too much praise for their foresightedness cannot be given to those members who formed the nucleus of the library, especially to Drs. H. Longstreet Taylor, J. L. Rothrock and Edouard Boeckmann, the last mentioned having been very generous in his gifts of books, journals, funds, and counsel. A more extensive account of the origin of the library may be found in Doctor Taylor's article in *Minnesota Medicine* for October, 1931, (Vol. XIV, p. 906). The library now contains over 20,000 volumes.

Building Fund of the Ramsey County Medical Society

The accumulation of a building fund by the Society without outside aid and without expense to any member, is without doubt one of the most remarkable events in the history of this Society and would be of any society. Properly, one should introduce here or at the end of every one of the enterprises of this Society a biography of Dr. Edouard Boeckman, as his biography would include the story of the initiation of all the enterprises of this Society which have been of permanent value. In the year 1901, the American Medical Association met in Saint Paul for the second time, and a considerable sum of money was raised for its entertainment. It so happened that after that convention a sum of money somewhat over $3,000 remained unexpended in the hands of the Entertainment Committee of which Dr. Charles A. Wheaton was chairman. As there was no means of ascertaining the method of disposing of this money, Doctor Wheaton kept it till March, 1904. After legal advice, he then turned it over to a committee of the Ramsey County Medical Society as a nucleus for a building fund. To this nucleus was annually added the small profits of the *Saint Paul Medical Journal,* while it existed, and the profits from the sale of catgut ligatures, except the sums appropriated for the maintenance of the library of the Society.

In 1926, Dr. F. E. Burch acquired in the name of the Society for the building fund the property on Ninth Street belonging to the Saint Paul Free Dispensary, and formerly the property of the Saint Paul Medical College. Aside from this generous acquisition through Doctor Burch the Building fund, one might say, is the result of the enterprise and practically the gift to the Society by Doctor Boeckmann. To show the appreciation of the unselfish devotion of Doctor Boeckmann to our Society, the Fund is now known as the "Boeckmann Library Building Fund." When the fund grows to a sufficient amount to build and maintain a proper home for the Society and care for its library, no doubt the Boeckmann Memorial will be erected.

Seal of the Ramsey County Medical Society

The following quotation from a letter written October 3, 1914, by Dr. Brewer Mattocks narrates the history of the seal of our Society:

> "As to the seal of our Society, we had none until I was elected to an honorary membership on my return to Saint Paul (about 1900), when I was, with the remaining charter members, Drs. Flagg, C. E. Smith and Wharton, appointed to secure the pictures of the charter members. It then occurred to me that we should have a seal and I suggested the legend, "Dissect, observe and write," in the imperative. I wrote Arch-Bishop Ireland to Latinize the motto for me. He was kind enough to send his secretary to me with the suggestion that the imperative be changed to the infinitive, and wrote the legend as it now stands. Drs. Flagg, Smith, and Wharton united with me in presenting the seal to the Society, which was graciously accepted as such, and no questions asked from the surviving charter members."

The seal was designed by R. O. Sweeney. No doubt many of the older members remember Sweeney's Drug Store on what used to be called Bridge Square, at Kellogg Boulevard and Wabasha St.

Doctor Mattocks was mistaken, however, as to the surviving charter members.

He should have included Doctor Boardman who was living in Brooklyn at that time.

Appended will be found a list of presidents of the Ramsey County Medical Society and the names of those who have held the positions of city and county physician, health commissioner, and coroner of Ramsey County.

Presidents of the Ramsey County Medical Society

1870	Daniel W. Hand*
1871	Alfred Wharton*
1872	Samuel D. Flagg*
1873	Charles E. Smith*
1874	John H. Murphy*
1875-79	Charles H. Boardman*
1880	Martin Hagan*
1881	Daniel Leasure*
1882	Daniel W. Hand*
1883	Albert E. Senkler*
1884	Charles A. Wheaton*
1885	James Davenport*
1886	Jay Owens*
1887	Parks Ritchie*
1888	James C. Markoe*
1889-90	Justus Ohage*
1891	Talbot Jones*
1892	William Davis
1893	John F. Fulton*
1894	Arthur B. Ancker*
1895	C. Eugene Riggs*
1896	Arthur J. Gillette*
1897	Jehiel W. Chamberlin*
1898	James A. Quinn*
1899	Edouard Boeckmann*
1900	Gustav A. Renz*
1901	Cornelius Williams*
1902	John L. Rothrock
1903	Angus McDonald*
1904	H. Longstreet Taylor*
1905	Arthur W. Dunning*
1906	Burnside Foster*
1907	Everton J. Abbott*
1908	Arthur Sweeney*
1909	Arnold Schwyzer
1910	Warren A. Dennis*
1911	James S. Gilfillan*
1912	Thomas W. Stumm*
1913	Charles J. Meade*
1914	John M. Armstrong
1915	Harry P. Ritchie
1916	Henry L. Nippert*
1917	James T. Christison
1918	Robert O. Earl
1919	E. W. Buckley*
1920	Charles N. McCloud*
1921	Frank E. Burch
1922	John C. Staley
1923	E. G. Sterner
1924	Carl L. Larsen
1925	E. M. Hammes
1926	C. C. Chatterton
1927	Francis J. Savage
1928	E. M. Jones
1929	Wallace H. Cole
1930	F. C. Schuldt
1931	O. W. Holcomb
1932	E. V. Goltz
1933	Harry Oerting
1934	Frederick J. Plondke
1935	Robert M. Burns
1936	Albert G. Schulze
1937	George K. Hagaman
1938	James N. Dunn

Dr. Alex J. Stone was elected in 1881, but as he was elected at that time president of the State Society he resigned and Dr. Daniel Leasure, vice president, succeeded to the office.

Those members who have served as president of the State Medical Association are:

1869-71	Samuel Willey*
1880-81	Alexander J. Stone*
1882-83	Perry H. Millard*
1888-89	Chas. A. Wheaton*
1891-92	Parks Ritchie*
1894-95	Justus Ohage*
1897-98	John F. Fulton*
1900-01	William Davis
1903-04	Chas. Lyman Greene*
1909-10	Cornelius Williams*
1912-13	Haldor Snévé*
1915-16	John T. Rogers*
1918-19	A. J. Gillette*
1921-22	C. Eugene Riggs*
1924-25	Archibald MacLaren*
1929-30	James T. Christison
1934-35	Francis J. Savage
1938-39	George A. Earl

Saint Paul City Physician and Health Officer

1854 James D. Goodrich
1855-56 Samuel Willey
1857-59 John V. Wren
1859 Jos. A. Vervais
1860-62 Thomas R. Potts†
1862-66 A. G. Brisbine†
June 1866-67 Thomas R. Potts
1867-71 E. Brewer Mattocks
1871 Martin Hagan
1872-74 Thomas R. Potts
1874-80 E. Brewer Mattocks
1880-84 Stewart and Wheaton

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*Deceased.
†Presidents—Saint Paul Academy of Medicine and Surgery.

City and County Physician

and Superintendent City and County Hospital (named Ancker Hospital after 1923)

1883-1923 Arthur B. Ancker
(died in office)
1923 John C. Staley
(resigned)
1923-24 Jesse L. McElroy
(resigned)
1925-35 Fred G. Carter
(resigned)
1935-1936 Seymour R. Lee
(died in office, Aug. 10, 1936)
1936- Thomas E. Broadie
(Aug. 25, 1936)

Saint Paul City Health Commissioner

1884 Henry F. Hoyt
1885-88 Talbot Jones
1888-95 Henry F. Hoyt
1895-99 A. J. Stone
1899-1907 Justus Ohage
1907-11 G. A. Renz
1911-14 Howard Lancaster
1914-18 Justus Ohage
1918-34 B. F. Simons
(died in office)
1934 N. G. Mortensen
(resigned)
1934- R. B. J. Schoch

Coroners of Ramsey County

1849-51 Charles Bazille†
1851-52 Orlando Simons†
(elected 1851)
1852-53 T. P. Reid†
(elected October, 1852)
1853 J. E. Fullerton†
(elected 1853, refused to serve)
1853-55 Charles Bazille†
(appointed, served till 1855)
1855 J. M. Castner†
(appointed 1855)
1855-57 Wm. H. Jarvis
1857 J. D. Goodrich
1858-60 J. V. Wren
1860-62 James M. Castner†*
1862-64 O. F. Ford†
1864-66 Philip Scheig†
1866-68 O. F. Ford†
1868-69 J. P. Melancon†
1869-70 H. M. Dodge†
1870-72 A. Guernon
1872-74 Patrick McEvoy†
1874-78 Peter Gabrielsen†
1878-80 Chas. A. Stein†
1880-84 James Davenport
1184-92 James A. Quinn
1893-97 E. H. Whitcomb
1897-1900 J. C. Nelson
1901-09 A. W. Miller
1910-19 D. C. Jones
1919- C. A. Ingerson

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*Appointed in place of John Farmington, who did not qualify.
†Not physicians.

Ramsey County Physician

1851 Charles Rich
and probably others
(no definite appointee)
1852 O. E. French
(apparently did not serve)
1852 Carlios
1853 J. D. Goodrich
1854 A. G. Brisbine
1855 J. D. Goodrich
1855-56 J. H. Murphy for St. Anthony
1856-57 J. H. Stewart
1858 Jos. A. Vervais
1860-61 Thos. R. Potts*
1862 Wm. Caine and C. D. Williams
1862-66 A. G. Brisbine*
1866-67 J. H. Murphy and A. Wharton
1868 C. E. Smith
1869 Guy D. Daly
(resigned 1869)
1870-74 C. E. Smith
1874-82 Brewer Mattocks
1882-84 Stewart and Wheaton

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*As president of the Saint Paul Academy of Medicine and Surgery.

(To be continued in July issue)

President's Letter

THE State Association meeting will be in progress as this issue goes to press and thanks are due to all who helped in preparations for it, particularly the Committee on Scientific Assembly, the groups from the University, the State Department of Health, the State Board of Control, the Local Minneapolis groups, Minneapolis City Health Department and the Department of Education. Hennepin County will be a fine host as usual and we wish to thank President Reynolds and the other officers, Chairman Cardle, all of his Committee and the Women's Auxiliary for the delightful entertainment they have arranged for this meeting.

The Medical Economics Committee is the largest in personnel of all our committees. It has a definite section in every issue of our State Journal and it deals with the changing social and economic conditions of the last decade coincident to the economic depression of world-wide range. The Committee has had to meet with active propaganda from governmental and liberal groups and it has been the responsibility of the Committee to judge what is and what is not of merit in the proposals set forth.

We have been fortunate in having an experienced and able Chairman, Dr. W. F. Braasch, whose long contact with organization work in the course of which he has served as President of the Association and delegate to the American Medical Association, has enabled him to conduct the work of the Committee with great force. He has had, of course, the help of an able committee composed of several important sub-committees. We have from time to time mentioned the work of these sub-committees and we wish to take occasion in this issue to express the appreciation of the Association to the Medical Advisory sub-committee composed of Dr. B. J. Branton, Dr. W. L. Burnap and Dr. W. H. Hengstler. This Committee has been a direct source of comfort to many of our members. Under Dr. Branton's leadership definite, tangible results have been produced as regards the methods of handling delicate situations and also in promoting a better understanding between the Bar Association and the Medical Association.

Dr. T. H. Sweetser, Chairman of the State Health Relations sub-committee, has worked as hard as anybody in the Association. No one has been more faithful in attending meetings or more conscientious in his handling of difficult situations. His committee has done much toward securing the best possible coöperation between our tax-supported agencies and the private practitioner.

Dr. W. A. Coventry, Chairman of the Committee on Low Income and Indigent Problems, brings to any committee a long experience, great ability and forceful effort. Of all our economic problems, probably this committee on Low Income and Indigent Problems is dealing with the most important. It is upon the groups of low income and on the indigent that recent demands for social change have been directed.

Under the chairmanship of Dr. F. J. Savage, the Committee on Interprofessional Relations have been active, also. It has sought the coöperation, particularly, of the dental and legal professions, and it has worked very closely with Dr. Branton's Committee. The contribution of these committees to our program has been beyond estimation. In other issues we shall have an opportunity to mention others which have also done excellent service.

George Earl, *President,*
Minnesota State Medical Association.

EDITORIAL

MINNESOTA MEDICINE

Official Journal of the Minnesota State Medical Association

Published by the Association under the direction of its Editing and Publishing Committee

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BUSINESS MANAGER
J. R. Bruce

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DIGITALIS UNIT CHANGED*

THE fact that the digitalis unit of the last Pharmacopeia of the United States (XI), which became official June 1, 1936, was increased over that of the U. S. P. X has received little attention and is not generally known. The new unit (U. S. P. XI) is the international or Magnus cat unit and is contained in 0.1 gram of the U. S. P. XI digitalis powder or 1 c.c. of the U. S. P. XI tincture of digitalis. This corresponds to 0.17 gram of the U. S. P. X digitalis powder or 1.7 c.c. of the U. S. P. X tincture. In other words, when a physician prescribes 1 c.c. of the new tincture, he is prescribing a dose corresponding to 1.7 c.c. of the older tincture.

The importance of this fact lies not so much in the gradual digitalization of a cardiac patient as in determining the maintenance dose or in determining the amount of the dose required for full digitalization. Whereas 1.5 grains of the U. S. P. X powdered leaf, or 15 minims of the U. S. P. X tincture per ten pounds of body weight, were required for nearly complete digitalization, this would be approximately 70 per cent too strong a dose in the preparations made official by the U. S. P. XI. If a patient eliminated 15 minims of the older tincture daily, he would more likely eliminate nearer 10 minims of the new tincture.

It is said that many pharmaceutical houses are still conforming to the U. S. P. X standard in the manufacture of their digitalis preparations. It becomes important at times to know, therefore, whether a preparation conforms to the tenth or eleventh edition of the pharmacopeia.

GOLDBLATT'S HUMORAL HYPOTHESIS

THE experiments which have been reported in the *Journal of Experimental Medicine* by Goldblatt during the past few years on the production of hypertension in dogs are of interest. By means of an ingenious clamp, he constricts the main artery of one or both kidneys, producing an ischemia of the organ. He has found that so treating one kidney usually results in an elevation of blood pressure which in a few weeks tends to recede and even return to normal. If such a treated kidney is removed while the blood pressure is elevated, the pressure returns promptly to normal. If, however, after the artery to one kidney is clamped, the normal kidney is removed, the elevated blood pressure persists.

If moderate clamping of the arteries to both kidneys is performed, an elevated blood pressure is produced which persists for months and even several years. While the urea clearance of such kidneys is reduced, the function of these kidneys is not otherwise impaired. Extreme clamping of the arteries produces symptoms of uremia. Most interesting is the observation that severing the nerve supply to the kidneys neither prevents nor relieves the hypertension.

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*For more detailed explanation of the subject, the reader is referred to Correspondence, Journal A.M.A., 112:1180, (March 25) 1939.

Microscopically the kidneys which have had their blood supply moderately reduced show thickening of Bowman's capsule and of the basement membrane of some of the glomeruli. The picture produced resembles that of essential hypertension, although the reduction in the blood supply is produced by narrowing the renal arteries, whereas in essential hypertension the narrowing takes place in the renal arteries.

Applying the clamp to other arteries such as the splenic or femoral, however, does not produce hypertension.

The author concludes from his experiments that ischemia of the kidneys is the common factor in experimental and essential hypertension and, inasmuch as experimental hypertension is independent of nerve supply, offers the hypothesis that ischemia of the kidneys produces some humoral substance in the kidneys which acts in some way, possibly directly on the muscles of the arterioles in general, to produce hypertension.

Goldblatt's idea, as we interpret it, is that generalized arteriolosclerosis causes ischemia of the kidneys which liberates some sort of humoral substance which causes through its action on the arterioles a further narrowing of the peripheral arterial bed, and hypertension follows. The generally accepted conception of a narrowed peripheral arterial bed being the cause of hypertension, is apparently maintained. It does seem as though an arteriolosclerosis sufficient to cause renal ischemia should be sufficient in itself to cause hypertension, without invoking a humoral hypothesis. The cause of arteriolosclerosis still remains to be determined.

THE STUDENTS' HEALTH SERVICE AT THE UNIVERSITY OF MINNESOTA

THE Students' Health Service of the University of Minnesota was established in 1918 because the University administration felt that it had a responsibility for the health of the students on the University campus. The policies and activities of the Health Service since its inception have been designed to attempt to prevent illness among University students and thus prevent the economic loss resulting from time lost from school.

The activities of the Health Service include complete physical examinations and health conferences for all students who enter the University; the control of communicable diseases; health examinations for all students who wish them, and as a requirement for students in the Colleges of Medicine, Dentistry and Nursing; clinical service for medical advice or care throughout the day and emergency service at night; hospital care for students in need of hospitalization; and dentistry, x-rays and laboratory service.

The health examinations required on entrance to the University, as well as the periodic examinations, are used not only to detect students who may have some communicable disease which might make them a danger to the University community but also as a basis for discussing with the student his health habits of living while at the University. Routine tuberculin tests and chest x-rays of positive reactors are a part of all complete physical examinations. Each year new cases of active tuberculosis are discovered as a result of this case-finding program. The Wassermann test is done routinely, also, as a part of the examination. Although the incidence of syphilis in the University population is very low, we believe the educational value of the Wassermann test makes it worth while. Many minor defects, such as malnutrition, dental caries, impairments of hearing and vision, et cetera, are found. Students are advised about having such defects corrected.

Medical service is available to students through the out-patient dispensary of the Students' Health Service. Students are encouraged to report to the dispensary with minor illnesses. Because of this fact not infrequently contagious diseases are discovered in the prodromal period, and thus the prevention of exposure to other students is attained. Approximately 90 per cent of the conditions for which students consult physicians in the Health Service dispensary are of such a minor nature that, were it not for the availability of the Health Service, no medical care whatever would be sought.

Any University student may be admitted to the Health Service infirmary, although the policy is to advise students who have family physicians to go home and place themselves under their care. The primary reason for providing an infirmary on the University campus is to care for students living in dormitories or rooming houses. These students who are living away from home make use of the Health Service infirmary and are hospitalized even for minor illnesses.

Ever since the Health Service was first started it has attempted to coöperate in every way possible with physicians engaged in the private practice of medicine. Occasionally we hear a report that the Health Service frequently performs surgical operations upon students who can afford to pay the fees of private surgeons. The facts are that only students who are self-supporting are given surgical care at the Health Service. As over 60 per cent of all students in the University are either wholly or partially self-supporting, a number of operations are done at the Health Service each year. Since no surgical fees are charged for these operations, the Health Service has nothing to gain by the performance of the operation, and obviously no member of the staff wishes to assume responsibility which he can pass on to someone else. The policy, therefore, has been to coöperate and not compete with the practicing physicians and surgeons in the state.

It is our hope that most of these students when they leave the University will have a much better understanding of modern medicine than they ever had before and will have learned to seek medical service promptly when ill, as well as seek the advice of the family physician for preventive medical work.

Ruth E. Boynton, M.D.,
Director.

EDITING AND PUBLISHING COMMITTEE

The resignation of Dr. James T. Christison from the Editing and Publishing Committee terminates twenty years of continuous and active service on the committee. Appointed in 1919, Dr. Christison has taken a deep interest in the journal's welfare and growth.

Dr. Christison has always taken an active part in medical organizations, for besides serving on numerous committees, he was president of the Ramsey County Medical Society in 1917, president of the Minnesota State Medical Association in 1929, and a state representative in the House of Delegates of the American Medical Association at the time of his retirement from active practice. It is the wish of the journal that Christy will be able to devote many years to his outside interests after many years of medical practice.

At its meeting in February, the Council appointed Dr. Thomas Gage Clement of Duluth to take Dr. Christison's place on the Editing and Publishing Committee. His appointment is the first to be made outside the Twin Cities and Rochester.

AMENDMENTS OF THE MINNESOTA BIRTH REGISTRATION LAW

The following announcement has been received from the office of the Minnesota Department of Health, of which A. J. Chesley, M.D., is secretary and executive officer:

Amendments of the Minnesota birth registration law enacted into law during the 1939 session of the Legislature, of interest to physicians, particularly to those practicing obstetrics and to those holding the official position of local registrar in cities, shorten the attending physician's time of reporting births to local registrars to five days, change the local registrar's time of reporting to the State Registrar to the fifth of the month, provide that physicians shall report births of illegitimate children direct to the State Registrar, and that the State Registrar may make and file replacement or substitute birth certificates under certain conditions.

Amendments Affecting Physicians

Physicians must report births to the local registrar within *five*, instead of within ten days.

Physicians must file birth certificates of illegitimate children direct with the State Registrar, not with the local registrar. The State Registrar must in turn send an abstract containing the surname of such child, the sex, and the date of birth to the local registrar, with instructions concerning its disposition, and instructions to direct anyone making inquiry about the birth record to the State Registrar.

When the attending physician is unable to certify the cause of death on the death certificate because of incomplete findings, he may substitute for the cause the statement: *"Cause not yet determined."*

Substitution of New Records

The State Registrar may make a substitute birth record whenever he receives proof satisfactory to him that:

(a) The parents of an illegitimate child have married each other.

(b) A court of competent jurisdiction has entered a judgment, order or decree relative to the parentage or adoption of a person.

When a substitute certificate is made, the original certificate and all documents pertaining to it must be withdrawn from the active file of birth records and placed in a sealed envelope in a confidential file. The envelope may be opened only upon written order of the State Registrar or of the court, and the original certificate may be copied only upon order of a court of record.

MINNESOTA LEGISLATURE PROVIDES FOR STUDY OF OCCUPATIONAL DISEASE UNDER WORKMEN'S COMPENSATION LAW

In the hope of determining what diseases are the result of occupational endeavor the 1939 Minnesota Legislature enacted a law providing for the reporting by physicians of cases believed by the medical profession to be the "result of the nature of the employment" of the particular individual. Ordinarily a workman is entitled to compensation and medical care at the expense of the employer only in the case of an accident arising out of and in the course of his employment. However, under the law as it has been for a number of years, certain diseases classified under the statute as the so-called "occupational diseases" are compensable in the same manner as accidents. The difficulty with the law, as it exists today, is that one worker with a disease listed under the law is compensated while another in perhaps the same industry with a different ailment is not compensated.

Many members of the medical profession have had the sad experience of devoting a great amount of time and effort to the treatment of an ailing workman, only to be informed that the ailment is not listed under the law as compensable, and therefore the physician cannot look to the employer for remuneration for his services. The law just enacted is quite simple in its terms, and is published in full below. When first introduced in the Legislature the bill had a penalty clause for failure of the physician to comply with its terms. It also provided that the report must be made within forty-eight hours. Both of these sections were stricken at the request of the Minnesota State Medical Association and the operation of the law placed on a purely voluntary coöperative basis. The importance of this study to the injured or ailing workman and to the medical profession cannot be over-emphasized. A prompt and enthusiastic coöperation on the part of the medical profession will enable all of us to assist in determining what amendments should be made to the present law on occupational disease. So that the physicians may have a better grasp of the problem there is also being published herewith the present Minnesota law on occupational diseases that are compensable.

Remember! the purpose of the 1939 law is to determine what diseases are of occupational origin in a given case. Read the law over carefully and then follow it. KEEP A COPY OF EVERY REPORT SENT TO THE STATE DEPARTMENT OF HEALTH. The Minnesota State Medical Association wants your suggestions and advice in this matter.

Committee on Public Policy,
Minnesota State Medical Association,
L. L. Sogge, *Chairman.*

* * *

CHAPTER 322—H. F. No. 651
A BILL

FOR AN ACT to provide for the investigation and control of poisoning and disease contracted as a result of the nature of employment, and for the reporting of such cases of poisoning and disease.

Be it enacted by the Legislature of the State of Minnesota:

Section 1. Any physician having under his professional care any person whom he believes to be suffering from poisoning from lead, phosphorus, arsenic, brass, silica dust, carbon monoxide gas, wood alcohol or mercury or their compounds, or from anthrax or from compressed-air illness or any other disease, contracted as a result of the nature of the employment of such person, shall, within five days, mail to the state department of health a report, stating the name, address and occupation of such patient, the name, address and business of his employer, the nature of the disease and such other information as may reasonably be required by said department. The department shall prepare and furnish the physicians of this state suitable blanks for the reports herein required. No report made pursuant to the provisions of this section shall be admissible as evidence of the facts therein stated in any action at law or in any action under the workmen's compensation act against any employer of such diseased person. The state department of health is authorized to investigate and to make recommendations for the elimination or prevention of occupational diseases which have been reported to it or which shall be reported to it in accordance with the provisions of this section. Said department is also authorized to study and provide advice in regard to conditions that may be suspected of causing occupational diseases, provided information obtained upon investigations made in accordance with the provisions of this section shall not be admissible as evidence in any action at law to recover damages for personal injury or in any action under the workmen's compensation act; provided further, that nothing herein contained shall be construed to interfere with or limit the powers of the department of labor and industry to make inspections of places of employment or issue orders for the protection of the health of the persons therein employed. Whenever upon investigation by the state board of health said board reaches a conclusion that a condition exists which is dangerous to the life and health of the workers in any industry or factory or other industrial institutions, it shall file a report thereon with the state department of labor and industry.

Approved April 20, 1939.

* * *

PRESENT MINNESOTA OCCUPATIONAL DISEASE LAW

OCCUPATIONAL DISEASES—HOW REGARDED—COMPENSATION FOR—DEFINITIONS OF —(1) The disablement of an employe resulting from an occupational disease described in sub-section (9) of this section, except where specifically otherwise provided, shall be treated as the happening of an accident within the meaning of Part 2 of this act and the procedure and practice provided in such Part 2 shall apply to all proceedings under this section, except where specifically otherwise provided herein. Whenever used in this section, "disability" means the state of being disabled from earning full wages at the work at which the employe was last employed, and "disablement" means the act of becoming so disabled.

(2) If an employe is disabled or dies and his disability or death is caused by one of the diseases mentioned in sub-section (9) of this section, and the disease is due to the nature of the corresponding employment as described in such sub-section in which such employe was engaged and was contracted therein, he or his dependents shall be entitled to compensation for his death or for the duration of his disability according to the provisions of Part 2 of this act, except as otherwise provided in this section; provided, however, that if it shall be determined that such employe is able to earn wages at another occupation which shall be neither unhealthful nor injurious, and such wages do not equal his full wages prior to the date of his disablement, the compensation payable shall be a percentage of full compensation proportionate to the reduction in his earning capacity.

(3) Neither the employe nor his dependents shall be entitled to compensation for disability or death resulting from disease unless the disease is due to the nature of his employment and contracted therein within the twelve months previous to the date of disablement, whether under one or more employers.

(4) If an employe at the time of his employment, wilfully and falsely represents in writing that he has not previously suffered from the disease which is the cause of his disability or death, no compensation shall be payable.

(5) The total compensation due shall be recoverable from the employer who last employed the employe in the employment to the nature of which the disease was due and in which it was contracted. If, however, such disease was contracted while such employe was in the employment of a prior employer, the employer who is made liable for the total compensation as provided by this sub-section, may appeal to the commission for an apportionment of such compensation among the several employers who since the contraction of such disease shall have employed such employe in the employment to the nature of which the disease was due. Such apportionment shall be proportioned to the time such employe was employed in the service of such employers, and shall be determined only after a hearing, notice of the time and place of which shall have been given to every employer alleged to be liable for any portion of such compensation. If the commission find that any portion of such compensation is payable by an employer prior to the employer who is made liable to the total compensation as provided by this sub-section, it shall make an award accordingly in favor of the last employer, and such award may be enforced in the same manner as an award for compensation.

(6) The employer to whom notice of death or disability is to be given, or against whom claim is to be made by the employer shall be the employer who last employed the employe during the said twelve months in the employment to the nature of which the disease was due and in which it was contracted, and such notice and claim shall be deemed seasonable as against prior employers.

(7) The employe or his dependents, if so requested, shall furnish the last employer or the commission with such information as to the names and addresses of all his other employers during the said twelve months, as he or they may possess; and if such information is not furnished, or is not sufficient to enable such last employer to take proceedings against a prior employer under sub-section (5) of this section, unless it be established that the disease actually was contracted while the employe was in his employment, such last employer shall not be liable to pay compensation, or, if such information is not furnished or if not sufficient to enable such last employer to take proceedings against other employers under sub-section (5) such last employer shall be liable only for such part of the total compensation as under the particular circumstances the commission may deem just; but a false statement in the information furnished as aforesaid shall not impair the employe's rights unless the last employer is prejudiced thereby.

(8) If the employe, at or immediately before the date of disablement, was employed in any process mentioned in the second column of the schedule of diseases in sub-section (9) of this section, and his disease is the disease in the first column of such schedule set opposite the description of the process, the disease presumptively shall be deemed to have been due to the nature of that employment.

(9) For the purposes of this act only the diseases enumerated in column one, following, shall be deemed to be occupational diseases:

Column 1.	Column 2.
Description of Diseases.	Description of Process.
1. Anthrax.	1. Handling of wool, hair, bristles, hides or skins.
2. Lead poisoning or its sequelæ.	2. Any process involving the use of lead or its preparations or compounds.
3. Mercury poisoning or its sequelæ.	3. Any process involving the use of mercury or its preparations or compounds.
4. Phosphorus poisoning or its sequelæ.	4. Any process involving the use of phosphorus or its preparations or compounds.
5. Arsenic poisoning or its sequelæ.	5. Any process involving the use of arsenic or its preparations or compounds.
6. Poisoning by wood alcohol.	6. Any process involving the use of wood alcohol or any preparation containing wood alcohol.
7. Poisoning by nitro and amido-derivatives of benzine (dinitro-benzol, anilin and others), or its sequelæ.	7. Any process involving the use of a nitro or amido-derivative of benzine or its preparations or compounds.
8. Poisoning by carbon bisulphide or its sequelæ.	8. Any process involving the use of carbon bisulphide or its preparations or compounds.
9. Poisoning by nitrous fumes or its sequelæ.	9. Any process in which nitrous fumes are evolved.
10. Poisoning by nickel carbonyl or its sequelæ.	10. Any process in which nickel carbonyl gas is evolved.
11. Dope poisoning (poisoning by tetrachlor-methane or any substance used as or in conjunction with a solvent for acetate of cellulose or its sequelæ).	11. Any process involving the use of any substance used as or in conjunction with a solvent for acetate of cellulose.
12. Poisoning by gonioma kamassi (African boxwood) or its sequelæ.	12. Any process in the manufacture of articles from gonioma kamassi (African boxwood).
13. Chrome ulceration or its sequelæ.	13. Any process involving the use of chromic acid or bichromate of ammonium potassium, or sodium, or their preparations.
14. Epitheliomatous cancer or ulceration of the skin or of the corneal surface of the eye, due to tar, pitch, bitumen, mineral oil or paraffin, or any compound, product or residue of any of these substances.	14. Handling or use of tar, pitch, bitumen, mineral oil, or paraffin or any compound, produce or residue of any of these substances.
15. Glanders.	15. Care or handling of any equine animal or the carcass of any such animal.
16. Compressed air illness or its sequelæ.	16. Any process carried on in compressed air.
17. Ankylostomiasis.	17. Mining.
18. Miner's nystagmus.	18. Mining.
19. Subcutaneous cellulitis of the hand (beat hand).	19. Mining.
20. Subcutaneous cellulitis over the patella (miner's beat knee).	20. Mining.
21. Acute bursitis over the elbow (miner's beat elbow).	21. Mining.

22. Inflammation of the synovial lining of the wrist joint and tendon sheaths.	22. Mining.
23. Cataract in glassworkers.	23. Processes in the manufacture of glass involving exposure to the glare of molten glass.
24. The following occupational diseases due to the hazards of fire fighting, myocarditis, coronary sclerosis, and pneumonia or its sequelæ in firemen.	24. Active duty with organized fire department.

(10) Nothing in this section shall affect the rights of an employe to recover compensation in respect to a disease to which this section does not apply if the disease is an accidental personal injury within the meaning of the other provisions of Part 2 of this act.

(11) The provisions of this section shall not apply to disability or death resulting from a disease contracted prior to the date on which this act takes effect.

Section 4327 Mason's Minnesota Statutes for 1927, as amended by Chapter 306, Laws of 1939:

A New Dietary Factor

About three years ago, Day, Langston and others of the University of Arkansas, placed monkeys on a presumably adequate diet containing all known vitamins. This diet consisted of a mixture of casein, polished rice, ground whole wheat, cod liver oil, ascorbic acid, salt mixture and sodium chloride. All monkeys fed this diet developed anemia, leukopenia, gingivitis, diarrhea, anorexia and loss of weight. Death invariably occurred in from one to three months. These investigators then tested the effects of the addition of nicotinic acid to their routine deficiency diet. The nicotinic acid had no demonstrable effect on the pellagra-like oral lesions in these animals. In later tests the Arkansas physiologists found that 1 mg. of riboflavin added to the daily diet will not prevent the development of pellagra in monkeys, nor will a combination of nicotinic acid, riboflavin and thiamin appreciably affect the course of this deficiency disease. If the daily deficiency diet is supplemented by 10 Gm. of dried brewers's yeast, however, or by 2 Gm. of liver extract, normal body growth and a normal blood picture are maintained over long periods. They conclude from these results that monkeys require some factor contained in yeast or in liver extract in addition to the factors commonly recognized as a part of the vitamin B complex. For this unknown nutritional factor they tentatively suggest the name "vitamin M." Attempts to isolate and identify the new antipellagra "vitamin" are now in progress in their laboratory. (J.A.M.A., April 1, 1939, p. 1258.)

Sulfanilimide and Tubercle Bacilli

The "wonder drug"—sulfanilimide—is being modified in the attempt to make it effective against the acid-fast tubercle and leprosy bacilli, but the work does not, as yet, permit any conclusion as to the efficacy of the new product in man. It is a combination of sulfanilimide and of cocoanut oil which it is hoped will enable the drug to penetrate the waxy content of the bacilli, which has heretofore served as armor against chemotherapy.—Crossley, M. L., with Northey, E. H., and Hultquist, M. E., *N. Y. Times,* April 7, 1939.

OF GENERAL INTEREST

Dr. C. H. Sherman, formerly of Oakes, North Dakota, is now associated with Dr. E. V. Strand, at Bayport, Minn.

* * *

Dr. George D. Kaiser, recently of Cokato, Minn., will attend the practice of Dr. S. W. Giere at Benson during the latter's absence in Hawaii on a two month's vacation. Dr. Giere left on May 20.

* * *

Dr. Joseph L. Garten, who recently completed a three-year fellowship in ophthalmology and otolaryngology at the Minneapolis General Hospital, announces his association with Doctors Malcolm C. Pfunder and E. J. Borgeson, of Minneapolis.

* * *

Dr. John L. McKelvey, Professor of Obstetrics, University of Minnesota, and Dr. Russell Moe of Duluth, recently successfully passed examinations of the American Board of Obstetrics and Gynecology, granting them the title of Diplomate.

* * *

The members of the Washington County Medical Society entertained their wives and guests at dinner at the Stillwater Club Rooms, May 9, 1939. This entertainment took the place of the scientific program, as this was the last meeting of the society until September.

* * *

Dr. Gerald T. Evans, assistant professor of physiological chemistry, Yale University, has been appointed associate professor of medicine and director of chemical and metabolic laboratories at the University Hospitals. Dr. Evans is a McGill graduate, class of 1932, and received the degree of Ph.D. from the University of Pennsylvania in 1937.

* * *

Dr. William Davis, well known general practitioner of Saint Paul, retired from active practice May 1, 1939. Graduating from Harvard Medical School in 1880, he spent a year in postgraduate work in Vienna and two years in practice at Syracuse, New York, before moving to Saint Paul in 1883. One of the founders of the Minnesota Academy of Medicine, he served as its president in 1903, was president of the Ramsey County Medical Society in 1892, and the Minnesota State Medical Association in 1901.

Such a record of fifty-five years of practice in one locality is hard to equal. During this time Dr. Davis has endeared himself to a large clientele and a wide circle of professional friends. He will now have time to devote to his large family, which includes several great grandchildren.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
W. F. Braasch, M.D., Chairman

NO EMERGENCY IN MINNESOTA

The 86th Annual Meeting is in progress at the Minneapolis Auditorium as this issue goes to press.

Many important matters are scheduled to come before the House of Delegates at this meeting and many others not already scheduled will undoubtedly be presented for consideration of delegates and officers.

It is remarkable in these times, however, and in contrast to the feverish experimentation in progress in a number of other state medical bodies, that no grave local emergencies confront the physicians of Minnesota.

A major legislative session ended without disturbing in any way Minnesota's enviable legislation for protection against unqualified practitioners and without disturbing, in any new enactments, the established plan for care of relief clients in rural counties. In point of fact, the legislative provision for free choice of physician was made more specific by addition of the phrase "for services and supplies" to the clause in the law providing free choice of vendor to the relief client.

It seems quite certain that Minnesota will not be a proving ground for experiments in new forms of medical service. On the other hand, it will undoubtedly continue to be pointed to as a national example for steady and continuous progress, with a close coöperation between practicing physicians and official agencies in the administration of service to the needy, and a net result of steadily diminishing morbidity and mortality rates. In many instances these rates set records for the entire United States.

Highlights of deliberations of both Council and House of Delegates will appear next month in these columns.

RESULTS OF THE SURVEY OF THE NEED AND SUPPLY OF MEDICAL CARE IN MINNESOTA

Attempts to make a survey of the need and supply of medical care in Minnesota met with a number of difficulties. It soon became evident that it was going to be difficult to arouse active interest in the survey and to get the members of the Association to understand its objectives and its importance to the practice of medicine. However, by means of repeated bulletins, letters and meetings, and particularly through the personal efforts of Mr. Rosell, many of the county societies responded to the call and turned in creditable reports.

Form No. 1 for physicians was distributed to 1,984 physicians and 739, or 37.2 per cent, were filled out and returned. The majority, or approximately 65 per cent, of the doctors reporting, had comments to make on the handling of indigent problems in this state. They appeared, furthermore, to express an unbiased opinion on these problems, free expression being due perhaps to the fact that they did not have to convey their identity. The greatest response came from the large cities, although several rural medical societies, such as Red River Valley, Blue Earth County, Blue Earth Valley, Wabasha, Watonwan and Washington Counties, responded wholeheartedly both in point of forms returned and in content.

While the number of physicians who filled out the different forms was somewhat disappointing, nevertheless the number compared favorably with that in most of the other states. In addition to the information obtained from the forms filled out by physicians, many data of value are available from the forms which were filled out by allied health agencies. These forms all required much time and effort for completion and much credit should be given to those coöperating in the survey. The data derived from these accumulated forms have given us information concerning the medical care in our state which has never been assembled before and which should be of great value in aiding us to correct any deficiencies revealed and guide our future plans.

While the following summary of the various data assembled and comments submitted by the profession is far from complete, it contains much that is of interest.

Estimates on Free Care

The actual number of persons who received free care as reported on the doctor's return reached a total of 75,468. This total included all who received care in the office, home or hospital in the state. It is not exact, however, being, in many cases only an estimate. Often the figure given was thought to be low, but, having no record, the physician was inclined to be conservative in his estimate.

The number of hours devoted by physicians in 1937 to the care of free ambulatory patients in outpatient departments, dispensaries and clinics showed a total of 23,896 hours. This figure included work devoted to the examination of CCC enrollees, school children in Summer Health Roundups and visiting clinics. Undoubtedly, this figure would have been greatly increased had the response been greater over the whole state.

For Private Practice

The general consensus of the doctors responding on the subject of state medicine or socialized medicine was that private practice of medicine without interference or dictation from the state should continue. One doctor in the Upper Mississippi Medical Society states the case—"The doctor-patient relationship is of high importance from the doctor's angle and more so from the patient's. Any attempt to dictate who shall 'doctor' who would destroy one of the finest personal relationships the world has ever known and one of the greatest healing values in the sick room. May this wonderful and valuable relationship never be destroyed. The indigent sick should be cared for by the doctors in the locality in which such particular indigent resides and the doctor should be paid from public funds direct at some reduced fee comparable to the services rendered. If possible the patient should be required to contribute some portion of the fees for services. This tends to prevent a total loss of pride from total charity and helps maintain an appreciation of the value of the services rendered."

Compromise Suggested

One doctor in the same district assumed a rather different attitude. He says, "I believe that some sort of restricted state medicine might offer more security to the less able and middle class of practitioner than the present state of affairs. The outstanding men of the medical profession, of course, always are able to ask and receive adequate compensation, and I believe always will be able to do so; but every doctor cannot be outstanding and we need the honest, fairly able men as much as the brilliant ones. Some final provision for these men seems to me to be a pressing need. I think the plan should come from the medical men and not the laymen. I am not enough of an economist to formulate such a plan, but I believe it will come from some source and that source should be the medical body."

"High Cost Is Problem"

Another doctor in Ramsey County Society says, "The cost of serious illness entailing expenses for hospitals, nurses, laboratory examinations and doctors is the most important problem to be solved. Insurance in some form is the logical solution to this unequal distribution. Coverage for this hazard cannot be complete any more than coverage for fire insurance can be complete as the moral hazard would be too great; also the overhead cost would be too great and the undertaking would become involved in politics. The present hospital plan meets this problem in a somewhat limited way by serving selected groups of the unemployed and their families. The suggested sickness insurance need not be impractical with the insured restricted to a certain income group, and a certain percentage of the medical bills paid directly according to a fee schedule approved by the local medical society. This would eliminate a lot of free care and would decrease the percentage of uncollectable bills. What is more important, it would be of great benefit to a group of patients who need financial assistance."

Education Needed

One-fourth of the doctors reporting in St. Louis County definitely stated that political influence is beginning to seep in and undermine the private practice of medicine. One elderly physician states, "Education of the public about medical care without reference to politics is needed. I certainly hate to think of the day when patients will be treated by 'political footballs' and not by private physicians. Am getting old, my years of practice are limited, but am thinking of the future patient and not the doctor and politician."

"Sick Well Cared For"

Most of the men reporting in all societies regard the set-up in their localities for the care of indigents as satisfactory. Many report that all doctors are doing everything in their power for borderline and indigent cases. One physician, an elderly man in the Park Region Society, says, "The sick are well taken care of in this community. This refers to the poor class. I do charity work every day and the sick are not neglected by any of the doctors. I think they are getting treatment the last few years better than any time I have been practicing medicine and that is forty years service." Another doctor in Camp Release Society says, "All the needy that I know have received better care than the average medium salaried family through the charitable medical and dental dispensaries from which the smaller salaried family can obtain no help. Discourage any plan for permanent relief set-up insofar as medical care is concerned. Stop making more charity patients, re-establish self-respect among the populace if any is left to re-establish."

University Hospital Crowded

In quite a few instances the doctors remarked that the service afforded by the University Hospital was inadequate due to the over-crowded conditions and the demand for beds. Two comments in the Clay-Becker Society referred to the use of the University Hospital for indigent patients—that the waiting list was too long and that they believed money spent on patients sent to the University Hospital could better be used to pay for their care in the local hospitals.

Welfare Work Criticized

Many of the doctors expressed annoyance with the quality of social service work as it is related to care of the needy sick. One doctor in St. Louis County offers the following comment in this connection: "I have found that wherever patients have gone without medical care or where such medical or hospital care has been hard to obtain it has been due to incompetent and indifferent, lazy welfare workers without medical training; these people have only one thought in mind and that is any easy job with a good pay check. They refuse to work after hours to investigate or help in most urgent cases of sickness. They have been trained in large cities and are not fit for work in rural counties."

One doctor in Mower County says, "Too much time is lost on investigations and not enough attention is paid to the thoroughly ill who could be in earning condition after surgical attention." He believes that the doctors themselves are partially to blame because of professional jealousies, for failure to allow those doctors who are willing to do so, to conduct free services."

Hospital Response Limited

Hospital Form No. 2 was sent out to 183 hospitals. From these, 68 forms were returned, representing a response of 37.16 per cent.

The greater hospitalization problem of indigents appears from the facts presented to be located in the large city hospitals rather than in the country hospitals. This undoubtedly is due somewhat to the fact that so many of the free patients are referred to the University Hospital for hospital care.

According to the figures submitted, a total of 126,206 persons received care in 1937. Of this total, 90,820 persons, or 71.2 per cent, were admitted as pay or part pay patients; 26,550, or 21.3 per cent, were admitted as public charges and 8,836, or 7.5 per cent, were admitted as free patients. There was a total of 1,474,940 patient days of hospital care reported in the survey, of which 670,947 days were devoted to pay and part pay care, 710,058 days were devoted to public charges and 193,935 days were devoted to free patients.

Rates Vary

The survey reports show a total of 7,185 beds available in the hospitals in Minnesota in 1937.

This figure is very inaccurate, however, since only 37.7 per cent of the hospitals reported. The actual figure as published in the Hospital number of the American Medical Association Journal showed a total of 21,983 beds available. The daily rates for hospital care showed a variance from a low of $1.35 for ward beds to a high of $3.50 for ward beds; a low of $1.35 for semi-private rooms to a high of $4.25 for semi-private; and a low of $3.50 for private rooms to a high of $10.00 for private rooms.

The general current of opinion as indicated in the survey showed that all facilities are operating with relative satisfaction to meet the problem of care for low income and indigent cases.

In the main, physicians, hospitals, welfare agencies, are doing the job well, though additional funds could be used, especially in health work among school children, and particularly in the care of children's teeth. There is no evidence, certainly, of any crisis demanding emergency measures.

W. F. B.

MEDICAL ECONOMICS FOR SENIOR MEDICAL STUDENTS

A comprehensive course of lectures on the economic, legal and social relations of the physician was initiated by Dean H. E. Diehl for senior medical students at the University of Minnesota during the spring quarter this year. For the first time lectures on these subjects were compulsory. They were given weekly as a part of the regular course.

The desirability of such a series has been urged by officers and committees of the Minnesota State Medical Association over a period of years. It has been a major part of the program of the Committee on Medical Economics and the Committee on University Relations, as well. Dean Diehl has the warm approval of all members of the association, therefore, in taking this step ahead in practical education. It is a step which will mean much to the young men who graduate in Medicine in Minnesota. It will also mean much to medical organization and to the maintenance of the ethics of the profession and to traditional standards of practice.

Titles and lecturers indicate clearly the excellence of the first course. They are as follows:

Medical Licensure	A. W. Adson
Ethics of the Practice of Medicine	S. Marx White
Management of Public and Private Patients	S. Marx White
Quackery, Fads, Cults and Patent Medicines	W. A. O'Brien
Malpractice	Mr. Ray Scallon
Starting the Practice of Medicine—Location, Relations with Other Physicians, and Hospitals, Fees, etc.	O. J. Hagen
The Physician in Court	Judge Paul Carroll
Medical Care of Indigents and Low Income Groups	R. E. Scammon
Health Insurance, Hospital Insurance, Attitude Toward Them of Organized Medicine	R. E. Scammon
Medical Organization, National, State, Local	C. B. Wright

"TREATING THE GERM"

(Monthly Editorial Prepared by the Medical Advisory Committee)

Over three years of study of the malpractice situation in the state has convinced your Medical Advisory Committee that malpractice problems constitute a disease which eats at the fundamentals of good medical practice much as any other germ disease causes a disturbance in the human economy and that it can only be treated by careful adherence to the tenets of good medical practice and forbearance toward one another.

There are four ways to treat this or any other disease:

First, we can stop this germ invasion by preventive means. Careful work and meticulous, detailed study of the cases as they present themselves with close follow-ups after treatment are preventive measures easily carried out.

Second, we can use the power of self control and professional ethics to confer immunity much as we do with vaccination and other prophylactic measures.

Third, we can develop a spontaneous, natural resistance to malpractice litigation within our Society by believing that all men who are practicing our profession have a right to their own opinions whether they agree with ours or not—a resistance which the public quickly senses and appreciates.

Fourth, we can use a method of direct attack on those who unknowingly, unwittingly or through the thought of personal gain or aggrandizement hope to enrich themselves at our expense, whether in our profession or any other.

We excise the disease-laden area if necessary to cure a disease of the body. Let us remove and eradicate from the body politic those in our midst who selfishly harbor the germs of discontent, prejudice, deceit, and intolerance to the rights of others. B. J. B.

". . . WE WILL DESTROY THE LAW ITSELF"

In view of the indictment of the American Medical Association for violation of the Sherman Anti-Trust Law the following quotation from a recent address by Thurman R. Arnold, Assistant Attorney General of the United States holds a peculiar interest for physicians.

"Anti-trust enforcement is not a moral problem. It is an economic problem requiring that rigid prohibition be tempered by a rule of reason. This requires exercise of judgment by the prosecutor and the court. If we insist on rigid standards and definitions, we will destroy the law itself.

Combinations which actually contribute to the efficiency of mass production should not be destroyed. Concerted action by groups of competitors to insure orderly marketing conditions should not be considered unreasonable. Where competition has been destroyed, mere imposition of penalties does not re-create it.

The Sherman Act is America's contribution to economic legislation. It can never be reduced to a rule-of-thumb. It can be clarified only by application to particular industries. It requires a referee with power to exercise judgment.

Wise business leadership should be willing to accept an independent judiciary as such a referee to preserve competition rather than to drift into combinations which in the long run can only end in positive government control of a regimented industrial economy."

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Forged Medical Prescriptions Bring Five Year Prison Sentence and $1,100.00 in Fines

Re: State of Minnesota vs. Harry C. Nagler.

Following a joint investigation made by J. Norman Peterson, Liquor Control Commissioner of Minnesota, and the Minnesota State Board of Medical Examiners, Harry C. Nagler, 55 years of age, former Minneapolis pharmacist, was sentenced on April 27, 1939, by Judge E. A. Montgomery in the District Court of Hennepin County, to a prison term of not to exceed five years. Nagler had entered a plea of guilty on March 27, 1939, to an information charging him with the crime of forgery in the second degree. The complaint against Nagler was signed by Mr. Brist on behalf of the Medical Board and charged him with forging a medical prescription to which Nagler had signed the name of "J. A. Ready, M.D."

The investigation disclosed that Nagler was born at Winona, Minnesota, in 1883, and had resided in Minneapolis for the past 40 years. He had been employed in a number of Minneapolis drug stores as an assistant pharmacist, but allowed his registration to lapse. At the time of his arrest he resided at 113 E. 15th St., Minneapolis. The investigation also disclosed that Nagler had forged several thousand medical prescriptions calling for whiskey, alcohol and other intoxicating liquor, and had forged the names of Dr. Ready, Dr. Haywood and Dr. Matchan. Nagler stated that he was acquainted with Dr. Frank L. Ready, a former Minneapolis physician, who moved to California in 1931. In view of Dr. Ready's absence from the state, Nagler stated he felt quite safe in changing the initials and forging Dr. Ready's name. Nagler also disposed of several hundred prescriptions to which the names of Dr. Robert D. Matchan and Dr. George M. Haywood had been forged. Dr. Matchan died in 1935 and Dr. Haywood died in 1933. Nagler believed that he would be safe in using these names.

Nagler disposed of the great bulk of these prescriptions to 11 Minneapolis drug stores operated by the following individuals: Sam Beugen, Alden Drug Co., 29 No. 12th St.; Philip Shelley, Aldrich Pharmacy, 733 6th Ave. N.; Fred Bassett, Bassett Drug Co., 301 4th St. S. E.; Maurice Gordon, Community Cut Rate Drug, 1504 Nicollet Ave.; Henry A. Glendenning, Dupont Drugs, 2659 Dupont Ave. S.; Alex H. Fjelstad, Fjelstad Drug Co., 3451 Cedar Ave.; Mayer S. Furman, Furman Drug Co., 1333 Nicollet Ave.; Sherman Kassmir, Kassmir Drug, 3200 Bryant Ave.; Henry Grodnik, Lyndale Pharmacy, 3701 Lyndale Ave. S.; Berniece Murdock, Murdock Pharmacy, 2451 Bloomington Ave.; and Paul B. Dix, Rustic Lodge Pharmacy, 4300 Nicollet Ave. Nagler stated to the Court that he sold these prescriptions to the various drug stores named, for sums ranging from five to fifteen cents per prescription. The records disclose that Nagler disposed of over 2,000 forged liquor prescriptions during January, February and March, 1939. Each of the foregoing druggists were arrested on April 27, 1939, on complaints charging them with selling intoxicating liquor without a license and entered a plea of guilty on the same date before Judge Fred B. Wright of the Municipal Court in Minneapolis and each one sentenced to pay a fine of $100.00 or to serve 60 days in the Minneapolis Workhouse. The fines totaling $1,100.00 were paid.

Mr. Peterson announced that the liquor permits of the 11 drug stores above named, all expiring April 30, 1939, would not be renewed by his department. This will prevent the drug stores named from filling physicians' prescriptions calling for whiskey, alcohol or other alcoholic liquors.

St. Paul Man Pleads Guilty to Illegal Sale of Medicine

Re: State of Minnesota vs. William McCoy.

On April 25, 1939, William McCoy, 34 years of age, entered a plea of guilty in the Municipal Court of St. Paul to a complaint charging him with dispensing, vending and selling, at retail, drugs and medicine, without being a licensed pharmacist. McCoy was sentenced to pay a fine of $50.00 or to serve 10 days in the St. Paul Workhouse. He paid the fine.

McCoy was arrested on February 9, 1939, following a joint investigation made by the St. Paul Police Department and the Minnesota State Board of Medical Examiners. The investigation resulted from complaint that young girls and married women were purchasing medicine from the National Health Service Bureau at 1591-1593 University Ave., St. Paul, for delayed menstruation. When questioned at Police headquarters, McCoy stated that he was the owner of the National Health Service Bureau and that he had operated it for a little over a year. He also signed a statement admitting that since he had been operating the National Health Service Bureau, he had performed between 20 and 25 abortions for an average fee of $40.00 per case. McCoy also stated that he was unmarried and lived at 594 Ashland Ave., St. Paul, and that he had resided in St. Paul all his life. McCoy is not licensed to practice any form of healing in the State of Minnesota, nor is he a registered pharmacist.

Neither the Minnesota State Board of Medical Examiners, nor its attorney, were consulted about the final disposition of this case in Court and the Medical Board does not approve of the disposition made. McCoy, at the time of his arrest, was charged with a gross misdemeanor, to-wit: in that he did "wrongfully, unlawfully and wilfully have in his possession, with intent to sell, a drug for causing unlawful abortions." Such an offense is punishable, under the laws of Minnesota, by a fine of not to exceed $500.00, or not more than one year in jail, or both. The Medical Board feels that this is the least that the defendant should have been charged with.

Alcohol Prescriptions Result in Convictions

Re: State of Minnesota vs. James O. Cavanaugh
State of Minnesota vs. E. M. Halloran
State of Minnesota vs. Thurlow E. Sundry

Following an investigation participated in by the St. Paul Police Department, the State Liquor Control Commissioner and the State Board of Medical Examiners as to the source of several hundred medical prescriptions for alcohol, James O. Cavanaugh, Dr. E. M. Halloran and Thurlow E. Sundry were arrested on May 4, 1939. Cavanaugh was charged with practicing medicine without a license, while Dr. Halloran and Mr. Sundry were charged with the sale of intoxicating liquor without a license. Cavanaugh, whose license to practice medicine was revoked by the Minnesota State Board of Medical Examiners in February, 1935, following his entering a plea of guilty in Federal Court in St. Paul to an indictment charging him with a violation of the Harrison Narcotic Law, plead guilty in the District Court of Ramsey County on May 8, 1939, and was placed on probation until June 10, 1940. Cavanaugh, who is 69 years of age, stated to the Court that he had been writing fictitious medical prescriptions for alcohol, which he sold to Sundry for 15c apiece. The records of the Liquor Control Commissioner show that Cavanaugh wrote 90 such prescriptions from January 1 to March 7, 1939. He stated that he had been doing this for about a year and a half. Cavanaugh also stated that he was suffering from a heart ailment and assured the Court that, under no circumstances, would he again attempt to practice medicine in any manner whatsoever without being licensed.

Dr. Halloran, who is 64 years of age, and who is licensed to practice medicine, with an office at 32 W. Central Avenue, St. Paul, plead guilty, in Municipal Court, on May 5, 1939, to a complaint charging him with the sale of intoxicating liquor without a license. Dr. Halloran stated that he, too, had been writing fictitious medical prescriptions for alcohol and selling them to Mr. Sundry for 15c apiece. The records show that Halloran wrote 140 such prescriptions from January 1 to April 30, 1939. Halloran stated to Judge Rensch that he was unable to pay a fine and assured the Court that, in the event any leniency was shown him, he would absolutely refrain from writing any liquor prescriptions in the future, whereupon, Judge Rensch sentenced Dr. Halloran to a term of 90 days in the St. Paul Workhouse and placed him on probation until November 25, 1939. Dr. Halloran was also required to appear before the Minnesota State Board of Medical Examiners at its next regular meeting in connection with the suspension or revocation of his license as a physician.

Sundry, who is 45 years of age, and a registered pharmacist, plead guilty in Municipal Court on May 5, 1939, to a complaint charging him with the sale of intoxicating liquor without a license. Sundry, who has a record of three previous convictions, was sentenced by Judge Rensch to a straight workhouse term of 30 days. The records show that Sundry was fined $350.00 in Federal Court in April, 1930, for selling liquor without a license. In July, 1937, he plead guilty in the Municipal Court of St. Paul, to selling liquor without a license and was fined $100.00. In April, 1938, he was tried by a jury in the Municipal Court of St. Paul, found guilty of driving a motor vehicle while under the influence of intoxicating liquor, and fined $100.00.

The Minnesota State Board of Medical Examiners intends to coöperate with the State Liquor Control Commissioner and the local police authorities in their efforts to stamp out the unlawful activities of a certain group of physicians and druggists who conspire to evade both the Liquor Control Act and the Medical Practice Act of Minnesota. This small group of physicians and druggists bring into disrepute all practitioners of medicine and pharmacy, and why it is even necessary, or profitable, to engage in such a conspiracy, is difficult to understand when one considers that in 60 counties out of 87 in Minnesota, the sale of liquor is lawful by those who have a license for that purpose.

Yellow Bone Marrow Concentrate

(The Armour Laboratories)

The Council on Pharmacy and Chemistry reports that in 1934 Armour Laboratories presented Yellow Bone Marrow Concentrate, stated to be "a concentrated oily solution of the physiologically active substances which promote the formation of granulocytes and are present in the yellow bone marrow of cattle and other domestic animals used for food by man." It is proposed for use in agranulocytosis. At that time the firm was informed that the Council could not report satisfactorily on the product because of the paucity of clinical evidence. In 1938 the firm reopened the matter and submitted reprints of two articles. The Council's referee reviewed this evidence carefully and reports that the beneficial effect of Yellow Bone Marrow Concentrate (The Armour Laboratories) has been evidenced in six cases of what seems to be true agranulocytic angina; that while this clinical evidence leaves something to be desired, it is recognized that the difficulty in securing cases is real. The Council felt that the evidence was not sufficient to warrant acceptance at this time and voted to hold consideration in abeyance pending the development of future corroborative evidence for the place of Yellow Bone Marrow Concentrate in the treatment of agranulocytosis, meanwhile authorizing publication of the foregoing preliminary report. (J.A.M.A., April 1, 1939, p. 1257.)

MEDICAL BROADCAST FOR JUNE

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 11:00 o'clock every Saturday morning over Station WCCO, Minneapolis (810 kilocycles or 370.2 meters) and Station WLB, University of Minnesota (760 kilocycles or 395 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month will be as follows:

June 3—Minnesota State Department of Health
June 10—Sanitation
June 17—Health Education
June 24—Dental Health Problem

AMERICAN CONGRESS ON OBSTETRICS AND GYNECOLOGY

The American Congress on Obstetrics and Gynecology is sponsored by the American Committee on Maternal Welfare. This committee is composed of member organizations with a representative from each, forming the board. The member organizations include the various national and sectional obstetrical and gynecological associations, hospital associations, public health organizations, and nursing associations.

The Central Association on Obstetrics and Gynecology proposed an American Congress on Obstetrics and Gynecology to study the present-day problems in obstetrics and gynecology and their solution. The American Committee on Maternal Welfare was asked to sponsor this Congress. The Congress will be held in Cleveland, Ohio, September 11-15, 1939. The Committee expresses the purpose of the Congress, "To present a program of our present-day medical, nursing, and health problems, from a scientific, practical, educational, and economic viewpoint as far as they relate to human reproduction and maternal and neonatal care." This Congress is not in any sense a legislative body and naturally will take no action relative to maternal and infant care.

There will be sessions for each professional group in the morning with round table discussions. The afternoon meetings will have papers of general interest to all members attending the Congress. The public will be invited to the evening sessions, where there will be speakers of national prominence.

The program for the physicians will include among many others such subjects as pregnancy associated with: thyroid disease, heart disease, diabetes, tuberculosis, nutritional factors, carcinoma of the female genitive tract, and abortions.

The Congress is not planned as a meeting for specialists in any sense of the word but for all physicians who are interested in the problem of maternal and child welfare. Your committee highly recommends this Congress as a week of postgraduate work which should be worth while much more to the physician than the time and expense incurred for the trip. The physicians of this state should be well represented at this Congress.

The membership fee of $5.00 includes membership in the American Committee on Maternal Welfare and registration in the American Congress on Obstetrics and Gynecology. Application blanks and further information may be secured from your chairman, or from the American Congress on Obstetrics and Gynecology, 650 Rush Street, Chicago, Illinois.

AMERICAN CONGRESS OF PHYSICAL THERAPY

The eighteenth annual scientific and clinical session of the American Congress of Physical Therapy will be held September 5, 6, 7, 8, 1939, at the Hotel Pennsylvania, New York City. Preceding these sessions the Congress will conduct an intensive instruction seminar in physical therapy for physicians and technicians, August 30, 31, September 1 and 2.

Physicians are urged to plan their vacation for these periods and bring their families to New York for the World's Fair.

The instruction seminar should prove of unusual interest to physicians and technicians. Registration is limited to 100 and is by application only. For information concerning seminar and preliminary program of convention proper, address American Congress of Physical Therapy, 30 North Michigan Avenue, Chicago.

REVISION OF THE PHARMACOPEIA

The Convention for the Revision of the Pharmacopeia, which convenes every ten years, will be held in Washington, D. C., May 14, 1940. The convention will elect officers, a board of trustees and a committee on revision consisting of fifty members, seventeen of whom will be doctors of medicine. In issuing the call, the president of the Convention, Dr. Walter A. Bastedo, requests that the various bodies authorized to send delegates appoint their full quota of delegates and select those informed and prepared to attend the Convention.

MINNEAPOLIS SURGICAL SOCIETY

Stated Meeting, Thursday, March 2, 1939

President, Dr. George R. Dunn, in the Chair.

FRACTURES OF THE SHOULDER GIRDLE

O. J. Campbell, M.D.

Dr. O. J. Campbell showed lantern slides and discussed the treatment of fractures of the shoulder. He emphasized the point that fractures of the surgical neck of the humerus in good position should not be placed in full abduction where the fragments may slip out of place. Rather, a compromise should be made with as much abduction as will permit maintenance of the original satisfactory position.

TREATMENT AND END-RESULTS OF FRACTURES OF THE HAND AND WRIST

R. E. Hultkrans, M.D.

In any discussion of fractures of the wrist, their treatment and the end-result, one must realize that a particularly wide variation of fractures is being considered. The most common wrist fracture is the popularly named Colles fracture. This term, Colles fracture, according to Key[4] is rather loosely used in the discussion of wrist fractures by physicians as well as in the medical literature. Dr. Abraham Colles was born in 1773 and died in 1843. His original article[2] describes a fracture of the distal head of the radius usually within less than 4 centimeters or approximately 1 inch of the distal articular surface of the radius and with resulting dorsal angulation. Obviously no x-rays were available during his lifetime so that the length of the fragments was based on clinical observation. One might say, therefore, that Colles fracture and fractures of the distal head of the radius are much the same for all practical purposes. Other fractures of the wrist joint will be discussed only briefly at the close of this paper.

In 1931, Dr. George R. Dunn[3] presented before this society an excellent article on Colles fracture with special reference to fractures resulting in impairment of function. The particular series of cases which he presented showed quite definitely that fractures of this type are not being efficiently reduced and that because of this fact rather high degrees of disability were resulting. In this particular paper, methods of reduction are accurately described as well as the usual methods of immobilization and end-results. His conclusions indicate that the average permanent disability involving the hand and wrist was 14.4 per cent loss of function of the hand and wrist. It is interesting to note that of these cases 24 per cent showed practically no disability whereas 74 per cent showed a rather high degree of disability. The average, therefore, does not seem to indicate a general low degree of disability in this particular type of fracture.

Reviewing the literature further we find that Dr. R. C. Webb[5] in 1921 advocated the use of palmar flexion and ulnar deviation as a means of maintaining position following manipulative correction of fractures of this type. It is quite apparent that this particular work went unnoticed until quite recently. About 1932 the work of Boehler[1] began to be popularized in this country. His particular work seemed to concentrate on active mobilization of unaffected parts concerned with Colles fracture. He has insisted that proper reduction was of first importance, followed by immobilization in a semineutral position with immediate active use of the fingers and thumb in the particular type of cast described in this work. He claims a high degree of efficiency from the standpoint of little loss of time from work and minimal permanent disability. While he admits that there may be certain fractures of the distal head of the radius that require fixation in marked palmar flexion, the general idea obtained from his work seems to be that marked palmar flexion is much more likely to cause severe disability than is the type of immobilization which he advocates.

With these introductory remarks let us consider then a typical Colles fracture. This type of case is usually seen within a matter of a few hours of the time that the injury occurred. Probably this is because injuries of this type usually result from a fall, and the individual in trying to break the fall stretches the arms or hands out. If a fracture results from such a fall, the immediate symptoms are acute enough to require prompt surgical attention. Rather rarely, an individual may sustain an injury to the distal head of the radius as the result of an accident and may waste a period of twenty-four to forty-eight hours before contacting a physician, but this seem to be quite rare.

Given then an acute Colles fracture the subsequent procedures are quite routine. The patient is usually taken to a hospital and an anesthetic administered and the fracture reduced. Depending on the type of fracture and the reduction obtained, further hospitalization does not appear necessary and most of these patients are usually classed as out-patients. Reduction of fractures in the office can be done, but where facilities are available we would recommend hospitalization.

It would seem that x-rays before and after reduction are imperative. Some men advocate reduction under fluoroscopic control. Our own reaction to this type of treatment is that the detail afforded by fluoroscopic control oftentimes is not sufficiently accurate to give satisfactory results. We prefer the use of the portable x-ray at the time of reduction.

Assuming then that proper treatment has been administered up to the point of immobilization, what type of immobilization is to be used? Here, perhaps is found the widest variation of opinion in the treatment of apparently simple uncomplicated Colles fractures. Some type of moulded plaster splint seems to be indicated quite definitely in preference to the mechanical metal splints offered by many surgical instrument houses. At the present time we feel that the use of the sugar-tong type of splint is by far the most satisfactory. This type of splint is readily made and is covered by a single layer of French flannel. The splint is applied by laying it on the dorsal aspect of the hand and forearm, continuing around the elbow to form the volar portion of this splint and then extending down to the metacarpal phalangeal joints of the hand. This means that the splint encircles the elbow and prevents supination and pronation of the forearm. This splint can be applied with the hand in a neutral position or with palmar flexion and ulnar deviation or any other variation of position desired. After the application of this type of immobilization the circulation is carefully checked and the arm placed in a sling. If the fracture has not been too serious and there is no accompanying shock, the patient is allowed to return home with instructions to watch for any impairment of circulation made apparent by symptoms of cyanosis, coldness of the fingers or sensory changes.

If satisfactory reduction has been obtained as noted on x-ray following the application of the immobilizing splint, further x-rays are usually made at the end of five to seven days to be sure that the position is being maintained. In certain types of fractures, additional x-rays at the end of two weeks are definitely indicated. Immobilization is then maintained until x-ray evidence of union becomes apparent. Subsequent thereto the usual routine physiotherapy methods are used to restore function.

The first case which we wish to present is that of a simple Colles fracture in a woman about sixty-five years of age. She was seen within an half hour after the fracture was sustained and the x-rays disclosed a typical Colles fracture. Reduction was accomplished easily under gas anesthesia and immobilization was done with anterior-posterior moulded plaster splint applied without padding to the skin. A checkup film made five days later showed the position to be well maintained. We felt we had accomplished a perfect reduction in this case and that the end-result would be perfect as well. We advised the patient accordingly and saw her at intervals until thirty-three days after reduction of the fracture another film was made. On this film a marked angulation of the distal fragment had occurred in an amount similar to that noted before reduction. Obviously there was sufficient callus thirty-three days after reduction to prevent any correction by manipulative procedure. She suffered intense pain for a period of about four months following the fracture of the wrist, when the pain became somewhat less. Two and a half years after reduction she was quite free from pain and had good function in the hand and wrist but the deformity was obvious and we felt that a rather high degree of permanent disability had occurred.

We had gone along setting Colles fractures with apparent good results and in many industrial cases without any permanent disability. We felt we could explain the situation in the above mentioned case on the basis of an absorption of the comminuted fragments of the dorsal aspect of the radius. Then we were confronted with a case of bilateral Colles fracture. In this case adequate reduction seemed to have been obtained and repeat x-rays made six days later showed maintenance of the position of the reduction. We felt, however, because of our experience in the preceding case it might be well to keep a little closer observation and therefore requested this patient to report for x-rays two and a half weeks after reduction. These x-rays showed a definite change of position of the fragment with dorsal angulation of the distal fragment of both wrists. Dr. O. W. Yoerg saw the films of this individual and offered this explanation for the slipping of the fragments. He said the patients with bilateral Colles fractures are handicapped a good deal in getting around at times. They use what little function is present much more actively than they would if only one arm were affected. Attempts are made to raise themselves in bed along with other attempts at movement, such as getting up and down from a chair. With the findings of dorsal angulation in both wrists we were confronted with the question of what to do next. This patient had been informed following the original reduction that a good reduction had been obtained and that a good recovery from her injuries could be anticipated. We felt that manipulative procedures could improve the position of the fragment in the slipped position. Accordingly, the patient was again taken to the hospital, given a general anesthetic and a Thomas wrench was used to reduce the fragments to better position. We were fortunate in obtaining a good reduction on the second attempt two and a half weeks after the original fractures were sustained. The subsequent end-result showed practically a normal contour in one wrist and one close to normal in the other. Following the period of immobilization required, considerable disability was present but with a series of twenty baking and massage treatments an excellent function was obtained.

Since then we have had one more case of bilateral Colles fractures, both severely comminuted. Both of these fractures were reduced under a local anesthesia and the position of fixation in each case was marked palmar flexion and marked ulnar deviation. Good anatomical position was obtained after the fractures were firmly united. This case is still under treatment and it is too early to determine whether or not any permanent disability will result.

In conclusion, we have felt that the first case presented could be explained on the basis of the absorption of bone. This may be correct. We feel, however, that had we applied forced palmar flexion and ulnar deviation, much of the deformity would have been avoided. The second case of slipping was recognized in time to attempt a second reduction with apparent worth-while results. The third case of bilateral Colles fracture was treated in marked palmar flexion and ulnar deviation, which we now advocate in all cases of this type where any comminution of the dorsal surface occurs. Certainly, good anatomical reduction and immobilization prevents deformity which may be very noticeable to the patient and definitely lessens the likelihood of permanent disability. The use of the sugar-tong splint for immobilization which prevents supination and pronation but permits palmar flexion and ulnar deviation has been our method of choice.

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Discussion

Dr. O. W. Yoerg: We are all proud of our good results and are rather hesitant in displaying our poor results or mistakes. We learn more from our cases that have gone wrong than from those that progress without complications. Dr. Hultkrans has given us a frank discussion of some of the pitfalls to be avoided in the treatment of wrist fractures. We have all had similar experiences, a good reduction that later slipped with resulting deformity.

I can only emphasize what Dr. Hultkrans has already mentioned relative to x-rays. I believe it well to x-ray the arm ten days to two weeks after reduction. If the bones have slipped you can still correct the displacement. If the bones are still in place at the end of two weeks and the fracture is properly supported, it is not likely that displacement will occur.

OPERATIVE REDUCTION OF THE NECK OF THE FEMUR

Motion Picture

Willard White, M.D.

A motion picture in color was shown by Dr. Willard D. White. This film depicted diagrammatic representation of steps in operations done for internal fixation in fractures of the neck of the femur. These diagrams were followed by the actual operations on patients. Pre-operative and post-operative x-ray films were shown, then the patients themselves were seen at various times after the operation, demonstrating the amount of activity, motion, et cetera. Two types of so-called closed operations were done. One, without the use of any preliminary guide of any kind, the nail being driven in directly after reduction of the fracture following a technic which was described in the film. The other closed operation entails the use of a 3/32 of an inch Steinman pin used as a preliminary guide. A cannulated nail was threaded over this guide and driven in place.

The so-called open operation was done for ununited fractures on patients who were seen several months after the injury. In this, the fracture site was exposed and the reduction done under direction vision, the fracture surfaces freshened, and the fragments united with a Smith-Peterson nail.

REDUCTION OF FRACTURES OF THE OS CALCIS

Motion Picture

O. W. Yoerg, M.D.

Dr. Yoerg showed a motion picture entitled "Os Calcis Fractures, an Improved Treatment," describing his method of reduction of these fractures, the after-care and convalescence.

General Discussion

Dr. Stanley R. Maxeiner: I enjoyed the papers this evening very much indeed. Dr. Campbell's reference to the treatment of the arm in less than 90° of abduction is extremely important and calls to mind that during the ten years I was associated with Dr. Farr, in the majority of cases, we treated these fractures in less than 90° of abduction with the Stromeyer pad. A piece of sheet metal approximately 3.5 feet long was bent to make a triangle. This triangle was well padded and the apex introduced into the axilla. The base kept the elbow separated from the hip and the arm was held against the body by the use of a Velpeau bandage. When greater abduction was required the patient was frequently put to bed and traction maintained laterally.

We are very prone in our discussions to neglect the work done by our own members and it affords me pleasure this evening to hear reference made to the splendid work done by Dr. Webb and Dr. Dunn. I recall numerous instances in which references were made to the reduction of Colles fractures under local anesthesia as recommended by Boehler. We all know that Dr. Farr pioneered in work on local anesthesia and was reducing all types of fractures under local anesthesia long before the name of Boehler was popularized in this part of the country.

Thirty years ago while I was an interne at the General Hospital, Dr. Farr treated a comminuted fracture of the tibia and fibula with a Steinman pin through the heel. Subsequently, in 1910 when I became associated with him, we had another severely comminuted fracture of the tibia and fibula which was treated again by the Steinman pin through the os calcis. This patient developed a high temperature of 104°, was highly delirious and went through an attack of typhoid fever. At many times it was scarcely possible to keep him in bed but the traction performed so efficiently that when the patient recovered from the typhoid fever he had excellent reduction of the fracture. To my knowledge these were two of the earliest cases treated with skeletal traction in this community. At that time I remember that Dr. Farr was severely criticized because of the danger of osteomyelitis and numerous other conjectural contraindications.

Recently, we attended a case of Colles fracture that would not remain reduced. On two different occasions the fragments could be readily nad accurately lined up but immediately after the application of molded plaster splints, the fragments either slipped forward or backward. It was impossible to maintain the distal fragment balanced on the end of the proximal fragment. A Kirschner wire was passed through the heads of the four metacarpal bones and traction applied, counter traction being maintained by a cast about the arm. Reduction was very simply maintained but it was necessary to continue traction over a rather prolonged period and delayed return of function has been quite noticeable. I believe, however, that in such comminuted fractures in which it is impossible to maintain adequate reduction, traction should be considered just as important as in comminuted fractures of the tibia and fibula. Dr. Allison states that this is the first time that a Colles fracture similarly treated has come to his attention.

I wish again to call your attention to Lahey's recent article on Colles fracture in which he recommends a fixation of at least six weeks in elderly people. He states that prolonged fixation is essential in older people because of slower healing and the more likely development of deformity.

Dr. Vernon Hart (by invitation): "Each one of the several papers has been extremely instructive and has emphasized fundamental surgical principles in fracture treatment. I should like to make a few remarks relative to each paper.

The principle of splinting fractures of the shoulder in the correct degree of abduction which Dr. Campbell stressed is a very important one. The x-ray studies should be carefully examined and then the degree of abduction determined by the individual problem.

Dr. Hultkrans emphasized many of the mechanical principles involved in the treatment of Colles fracture but he did not stress the importance of proper physiotherapy. We occasionally see patients who have considerable disability resulting from this injury. It is my opinion that most of the disability which we observe in these patients is not due to the inadequate reduction but is the result of inadequate postoperative physiotherapy. I believe that the position of the fragments which Dr. Hultkrans considered rather poor is satisfactory and would be compatible with normal function if proper physiotherapy were instituted. By physiotherapy I do not mean heat, massage, and passive exercises that someone else does for the patient, but I refer to elevation and active exercises which the patient performs himself. Every patient with a Colles fracture should be taught to be his own physiotherapist. These patients often come to us many weeks or many months after their injury with marked disability of the shoulder. They have a subdeltoid bursitis with contractures and adhesions which cause marked limitation of abduction and the rotations of the shoulder. At the time of the original fall, part of the violence is transmitted to the shoulder and there is an impaction between the head of the humerus and the glenoid, and soft tissue trauma. The day of the reduction one should instruct the patient to actively completely abduct, externally rotate and internally rotate the shoulder. This program will prevent shoulder complications. The same day of the manipulation or at least the following day the patient should be instructed to actively move each finger through the full range of motion at each individual joint, to approximate the thumb to the tips of the fingers, to flex and extend, abduct and adduct the fingers and the thumb, and to actively use the fingers in eating, and combing the hair. By active exercises and elevation one can restore motion very rapidly and prevent disability of the thumb and fingers.

I object to the use of the sugar-tongs splint because in Colles fractures with subsequent difficulty there is usually a radial deviation of the distal fragment. The radial deviation of the distal fragment is the most difficult problem with which we have to deal. The dorsal displacement of the distal fragment can easily be controlled by moderate palmar flexion of the wrist. The important position following reduction is ulnar deviation. With a sugar-tongs splint, plaster is placed on the extensor surface and on the flexor surface with a gauze bandage on the radial side. If one wishes to maintain ulnar deviation or to maintain the correction of the radial deviation, then the radial side of the forearm and hand as far as the end of the second metacarpal shaft should be adequately splinted. The simplest and most efficient splint is a non-padded, very thin circular plaster of Paris cast split on the ulnar side but not on the radial side. Besides physiotherapy to the shoulder, fingers and thumb, one should, very early, restore rotation. It is often stated that with a cast on the forearm incorporating the wrist, rotations should not be encouraged. The patient should be instructed during the first week to try to restore rotations, pronation and supination.

The principle that Dr. Maxeiner mentioned regarding the period of immobilization is important. The cast should be left on for a period of four weeks or five weeks before it is removed, assuming, of course, that proper reduction has been accomplished and maintained. I refer to the fractures which require manipulative reduction.

Dr. White certainly should be congratulated. He has made special studies of hip fractures which is apparent in his presentation tonight. He has shown a very scientific interest in fractures of the hip, and the technic which he has developed is on a very scientific basis. He should be highly complimented. Dr. Yoerg has contributed very much to the treatment of fractures of the os calcis and he has put a stop to the radical treatment of fractures of the os calcis. His method is a conservative and sound one and gives excellent results.

WOMEN'S AUXILIARY

Mrs. W. B. Roberts, Minneapolis, *President*
Mrs. E. V. Goltz, 2259 Summit Avenue, Saint Paul, *Publicity Chairman*

The Washington County Auxiliary was entertained Tuesday, May 9, by Mrs. E. V. Strand at a dessert luncheon at one-thirty at her home in Bayport. Eight members and two guests were present. Mrs. C. Sherman was welcomed into the organization as a new member. Following the business session, plans were discussed for a representation at the state meeting, which is to be held in Minneapolis May 31 to June 2. The auxiliary enlisted its membership in the Minnesota Division of the Women's Field Army of the American Society for the Control of Cancer.

* * *

The Ramsey County Auxiliary held its annual meeting May 22 at the Sibley House, Mendota, where a luncheon was served. Annual reports were read and new officers elected. Mrs. E. A. Nichols, the president, presided.

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Friday, May 5, the annual meeting of the Hennepin County Auxiliary was held at the Minneapolis Y.W.C.A. The following new officers were elected: President, Mrs. E. S. Mariette; president-elect, Mrs. W. E. Willcutt; first vice president, Mrs. Martin Aune; second vice president, Mrs. James Johnson; recording secretary, Mrs. J. K. Moen; corresponding secretary, Mrs. P. J. Schultz; treasurer, Mrs. A. H. McFarland; auditor, Mrs. J. P. Hiebert; custodian, Mrs. L. R. Boies.

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of March 8, 1939

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, March 8, 1939. Dinner was served at 7 o'clock and the meeting was called to order at 8 p. m. by the president, Dr. Carl B. Drake.

There were forty-nine members and one guest present.

Minutes of the February meeting were read and approved.

The Secretary then read two proposed amendments to the Constitution, as follows:

Article III, Sect. 1, just ahead of the last paragraph: "There shall also be a Senior Membership."

Article III, Sect. 2, to be inserted at end of section: "Senior members shall be those Active, Associate or University members who have paid dues for a period of 25 years and who have presented a written request to have their names taken from those lists and placed on the senior membership list, provided their request has been approved by the Executive Committee and favorably acted on in open meeting. Senior members shall enjoy all privileges of active members excepting that they may not hold office or participate in elections. Attendance at meetings is not obligatory. Senior members will not pay dues but will be expected to pay the usual dinner fees. The transfer of any such name to the senior membership list shall create a vacancy in the other membership lists, provided said member has not been a former president of the Academy."

These amendments had been approved by the Executive Committee and will be published on the next bulletin and voted on at the April meeting.

The scientific program followed.

AUDIOMETERS AND HEARING AIDS IN MEDICAL PRACTICE

Horace Newhart, M.D.
Minneapolis

and

Prof. Henry Hartig
University of Minnesota

Dr. Newhart, Minneapolis, read a paper on the above subject, and Professor Henry Hartig, of the Electrical Engineering Department at the University of Minnesota, demonstrated the use of the audiometer and two hearing aids of different manufacture. Lantern slides were shown.

Discussion

Dr. Charles E. Connor, St. Paul: The selection of the proper hearing aid is frequently a difficult problem; the period of hearing impairment through which the deafened have passed has not only frequently eliminated ordinary adventitious sounds such as the rustling of paper, shutting of doors, but has also permitted the development of the hypersensitive, introspective psychology so characteristic of the deafened. Then, too, they not infrequently possess much information (or misinformation) based on the experiences (happy or unhappy) of their friends, on advertisements in the public press, and on high-pressure sales talks of self-styled audiometrists in jewelry and department stores.

Or they may have tried to pick a hearing aid on their own initiative. They have been placed across a table from a person trained in the technic of salesmanship, in a sound-proof room; no wonder they hear better. But, on taking the aid home, they are surprised and discouraged to find they can't hear so well. Then they come in and want to know what is to be done.

A period of psychological re-education is fundamentally necessary for these people. Adventitious sounds obscure what they are trying so hard to hear and after a little while they become nervously fatigued and completely discouraged. Their greatest need is sympathetic, intelligent, and disinterested guidance and the realization that much time and patience is required to effect the readjustment necessary to secure the greatest benefit from their hearing aid.

CEREBRAL CALCIFICATION

Gordon R. Kamman, M.D.

Department of Nervous and Mental Diseases
University of Minnesota
Saint Paul, Minnesota

Abstract

Cerebral calcification may occur physiologically or it may occur as a pathologic manifestation. Pathologic calcification may occur symmetrically or asymmetrically.

Symmetrical cerebral calcification usually occurs in the basal ganglia and is easily diagnosed roentgenographically. In this condition the changes are in and about the finer blood vessels, particularly in the lenticular nuclei.

Asymmetrical cerebral calcification may occur in any one of a number of pathological conditions. A particularly interesting type is that known as Parkes Weber-Dimitri disease. In this condition the calcification is unique in that it appears to be tubular and corkscrew-like, and seems to follow the outlines of the gyri of the brain.

In both symmetrical and asymmetrical calcification, including Parkes Weber-Dimitri disease, epileptiform seizures and mental deterioration are the most common symptoms. Defects in the visual fields, facial nevi, parkinsonism, cerebral atrophy, and choked disc have also been reported.

The case reported here is that of a 21-year-old single female who had epileptiform seizures, optic atrophy, visual field defect, and the characteristic roentgenographic picture of Parkes Weber-Dimitri type of cerebral calcification. Encephalograms showed cerebral atrophy.

(Full paper to appear later in Minnesota Medicine)

The meeting adjourned.

A. G. Schulze, M.D., *Secretary.*

BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

A MANUAL OF FRACTURES AND DISLOCATIONS. Barbara Bartlett Stimson, A.B., M.D., Med. Sc.D., F.A.C.S. 214 pages. Illus. Price, $2.75. Philadelphia: Lea & Febiger, 1939.

This manual was compiled by Dr. Stimson, a member of the staff at Columbia-Presbyterian Medical Center, for the use of students. For the student it can be a great aid, but it can hardly be regarded as a source of information for the practitioner who is involved in the actual care and management of fractures and dislocations.

A summary of the salient points regarding each fracture is appended to each discussion. The illustrations are unique and forceful by the simple process of being semi-diagrammatic. The treatment discussed is well founded and generally recognized.

Criticism might be directed at the lack of interpretation of findings in the light of muscle mechanics and also at the lack of emphasis on the x-ray as a means of diagnosis and as an aid in following the progress of healing.

The book is divided into a first part, which concerns such matters as the physiology of bone repair and the principles of treatment of fractures. The remaining three parts consist of chapters on the upper extremity, the trunk, and the lower extremity, respectively.

K. E. Fritzell, M.D.

CLINICAL GASTROENTEROLOGY. Horace Wendell Soper, M.D. 314 pages. Illus. Price $6.00. St. Louis: The C. V. Mosby Co., 1939.

The author states in the preface that "The object of this work is to cover the field of gastroenterology with particular emphasis on diagnosis and treatment," and he appears to have produced a work that is interesting and informative.

It should be of great help to the general practitioner, as it not only covers organic disease of the digestive tract, but functional disturbances as well. These comments are particularly valuable since the majority of texts on this subject make no attempt to emphasize the importance of such disorders.

Diverticulosis of the colon, polyposis of the colon and regional ileitis are some of the conditions described, as well as the more widely discussed peptic ulcer. The author has also included chapters on diseases of the liver, pancreas and gallbladder, and presents the technic of the ever-important proctoscopic examination.

The book has a practical value for anyone treating digestive disorders, and should prove a great aid to the man who does his own gastrointestinal x-ray, as the book contains many reproductions of characteristic radiographs.

There is enough of the physiology of the digestive tract to make it interesting and instructive to the average man, and an excellent bibliography for those who wish further details.

Richard Bardon, M.D.

A CONVENIENT OFFICE TREATMENT FOR TRICHOMONAS VAGINITIS

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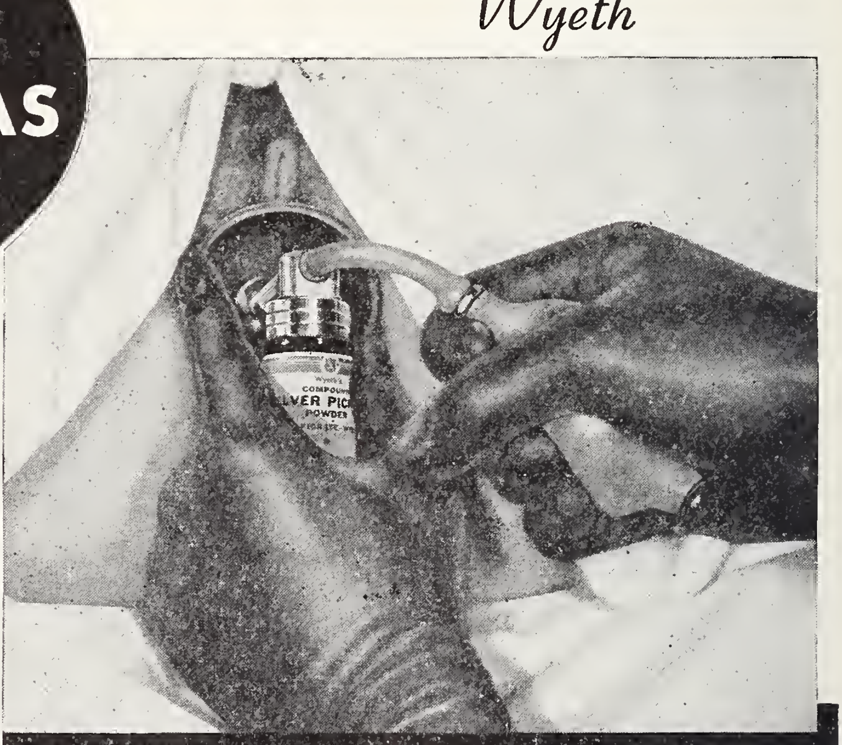

THIS simple treatment requires but two office visits, a week apart, for insufflations and the nightly insertion of a Silver Picrate suppository for twelve nights.

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MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

Volume 22 JULY, 1939 No. 7

THE CESAREAN PROBLEM*

R. T. LA VAKE, M.D., F.A.C.S.
Minneapolis, Minnesota

DURING the past twenty-five years obstetrics has made great advances in procedures potential for the reduction of maternal mortality. The perfection of roentgen-ray technic has made possible the more accurate diagnosis of any abnormality of the bony pelvis. The development of high carbohydrate therapy and hydration by intravenous glucose administration, together with our knowledge of vitamin B deficiency, has increased our chances of curing pernicious vomiting and have reduced the frequency of the dangerous necessity of therapeutic abortion. The perfection and more widespread realization of the value of prenatal care have increased the likelihood of bringing women to labor in better general physical condition and with the birth canal uninfected. Again, prenatal care has made for the earlier detection of the approach of preëclamptic toxemia and improved treatment has made the accession of eclampsia less frequent; and, in addition, conservative treatment of eclampsia has proven its superiority over accouchement forcé and major operative interference. We have learned about droplet infection and the importance of excluding those with colds, throat and sinus infection, from attendance on women in labor and the importance of masking all attending nurses and physicians throughout labor. The perfection of blood transfusion technic and the more widespread realization of its value have increased our command over the results of hemorrhage, shock and infection. Further experience with the low cervical cesarean section has incontestably proven its marked superiority over classical section in point of lower maternal morbidity and mortality, and the substitution of local novocaine anesthesia in place of inhalation anesthesia, where possible, has added to the safety of the operation.

In spite of all of these advances, it is a striking fact that the general maternal mortality rate has been reduced very little. This fact is rendered more striking when we consider that, in addition to these advances, we have seen a narrowing of those areas previously inaccessible to medical attention. We have seen tremendous educational campaigns that must have reduced the factors of public ignorance and apathy to a certain extent. We have witnessed the wide extension of social service and public health nursing, and the extension of special facilities for maternal care, including personnel and materiel, in nearly every town of any appreciable size. And year by year, though obstetrical education has always had its faults and limitations, at least facilities for teaching have continuously improved.

The great discrepancy between what one would reasonably expect in the lowering of general maternal mortality and the facts as proved by statistics has led to continuous investigations and controversies. A study of these investigations insistently suggests: that, with the more widespread dissemination and absorption of at least a rudimentary surgical knowledge, and emboldened by a false feeling of security engendered by the remarkable achievements of some of our masters in the obstetric art, and with the extension of hospital facilities of standardized perfection, an increasing number of inadequately trained men are availing themselves of the facilities of the art of obstetrics without waiting to learn the principles of the art; and that an increasing spirit of radicalism, that has not confined itself to the untrained and the inexperienced, has activated many men to operate without proper regard for well-recognized indications and often in defiance of contraindications, with results that have clearly placed the errors and abuses of operative obstetrics in the forefront of those causes that have retarded the reduction of general maternal mortality. A more specific and comprehensive analysis of the factors causing increased operative rate is that of Dr. E. D. Plass:[52]

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*President's Address, read before the Minnesota Academy of Medicine at the meeting of January 11, 1939.

1. Sense of security engendered by the use of modern antiseptics and asepsis.
2. Employment of anesthetics.
3. An exaggerated idea of the value of the infant's life as compared with the life and health of the mother.
4. Demand for shorter and more comfortable labors.
5. Convenience of patient, husband, doctor or other person.
6. Education of the laity to a higher scale of fees for operative procedures, although often the value of services in non-operative deliveries is much greater.

Among obstetrical operations, cesarean section has become so prominent as a factor in preventable maternal mortality that it has become a veritable problem and I have chosen this problem for discussion because I am convinced that there is every indication that it will continue to be an increasing factor in preventable maternal mortality unless each and every member of the profession, no matter what his individual specialty may be, understands the problem thoroughly and lends his aid to its solution in the general staff meetings of the hospitals to which he belongs. It is the one obstetrical problem that lends itself entirely to hospital staff influence. All other obstetrical errors and abuses causing preventable maternal mortality may be consummated outside of a hospital and beyond staff influence, but not cesarean section.

The modern trend toward the wide extension of indications for, and incidence of, cesarean section, and its manifest alarming results, has given those interested in maternal mortality ample cause for alarm and criticism. Warning literature and medical education, however, have had little apparent influence in checking the rapid increase in incidence and the increase in mortality toll. Those of you who have not practiced obstetrics for many years or have never practiced obstetrics, have, I believe, little realization of the conditions surrounding the private practice of obstetrics today in regard to cesarean section. Twenty-five years ago it was difficult to persuade the average patient and her family to permit a very necessary cesarean operation. Today, at every delay in labor, the family and friends ask why this operation is not being done. And, if the child succumbs under delivery by the natural channels, the implication is that somewhere mismanagement has obtained. Had Doctor So-and-So had the case, he would have done a cesarean. Even the general medical profession has a tendency to assume this attitude, due largely to the increasing number of cesarean sections performed, coupled with the ever-increasing number of reports of large series without a death. Few men publish their poor results and disasters. These are picked up only in surveys and other painstaking studies that are too expensive in time and money to be very frequent. The general profession does not have time to study the whole picture. The young obstetrician with conservative tendencies is today on the spot, so to speak. If he treats a case conscientiously and conservatively and loses the baby, the death is discussed in the monthly hospital staff meeting. If his confrere performs a cesarean section at the first appearance of delay, yet for no justifiable indication, and baby and mother live, nothing is said except in praise of his acumen.

If we are to stop this dangerous increase in cesarean sections, the general profession must give obstetricians the same backing for the performance of good safe obstetrics that we all had twenty-five years ago.

Throughout the literature it is obvious that the aim of our pioneers has been to so reduce the operative mortality of cesarean section that it can be substituted, without increased risk for the mother, for measures that result in higher infant morbidity and mortality. Progress in this direction accounts by natural law for some of the increase in incidence. But many physicians and the public have greatly over-estimated this progress. It is true that the progress in this direction which has been made by men whose obstetrical judgment has kept pace with their improvement of technic has been remarkable. Unfortunately, the published results of such men have misled practicing obstetricians, the general profession and the public. Few men can be well-rounded virtuosi no matter how fine their training and no matter how assiduously they practice.

TABLE I

Deliveries—49,397		Contracted Pelves—5.288		
			Maternal Mortality	Mortality of Child
Spontaneous births	4116	77.8%	.09%	2.2%
Forceps with head in pelvis	207	3.9%	0.0%	11.6%
Turning in transverse presentation	353	6.6%	.5%	28.6%
Extraction in breech	30	.5%	3.3%	40. %
Craniotomy in dead child	82	1.5%	6.0%	100. %
Decapitation	9	.16%	33.3%	100. %
Artificial premature labor	34	.6%	2.9%	47. %
Prophylactic turning	94	1.7%	1.05%	21. %
Forceps above brim	147	2.7%	1.3%	38.7%
Craniotomy on living child	76	1.4%	1.3%	100. %
Cesarean section	116	2.1%	3.4%	1.7%
Widening of pelvis	23	2. %	0.0%	4.3%
Total	5,288	10.7%	.45%	9.28%

The most reliable statistics today show that the average operative mortality of cesarean section is at least four times higher than that of our virtuosi. As this average includes the results of our virtuosi, one can estimate what the accomplishment of others must be. Dr. Frank Lynch,[39] in the largest compilation of cesarean sections performed since 1930, 12,955 sections, gives the incidence as 2.5 per cent and the operative mortality 4.1 per cent. Dr. Joseph B. DeLee[16] reports 1,875 low cervical operations from the Chicago Lying-In Hospital, with an operative mortality of .96 per cent. Dr. Frederick C. Irving[32] reports the operative mortality of 2,467 low cervical operations as reported by fifteen authors in the past six years, as 1.6 per cent.

Now let us compare these figures with those from Dr. Shauta's[57] clinic given in 1909, relative to the treatment of contracted pelves. (Table I)

It is striking that, even for the fundamental indication of contracted pelvis, the incidence of cesarean section in 49,397 deliveries was only .23 per cent and the cesarean mortality was 3.4 per cent. Would any one suggest that Shauta and his coworkers were not just as anxious as our best obstetricians of today to substitute section for the types of handling that gave a higher infant mortality? He was specific in suggesting the future possibility of such substitution, but specified that such substitution were unwise unless the patients presented with no form of previous vaginal interference. Shauta was one of the first men to present a large series of cesarean sections without a death, and we can be certain that it was not poor judgment or lack of operative ability that limited the incidence in this exhibit. Were Dr. Shauta with us today, his incidence would no doubt be as proportionately higher as his operative mortality could be lowered.

The following are Shauta's opinions:

> "Spontaneous birth affords by far the best solution of the many complicated problems of contracted pelves. The objection might naturally be made that spontaneous birth is not always possible. This is unfortunately quite correct. But spontaneous birth is more frequently possible than it appears from our statistics. By premature interference with its natural course, many cases of labor are directed into a wrong course and result in great injury to both mother and child. There is no doubt that if these principles, admitted in the present day, were universally and steadily observed, the number of spontaneous births in contracted pelves would steadily increase. At my clinic about 80 per cent of the births with narrow pelves actually occur spontaneously, only full-term births being taken into account. The application of forceps above the brim and prophylactic turning should, if possible, be entirely removed from the list of methods of treatment of contracted pelvis. Before craniotomy on the living child is undertaken, prophylactic turning may be justified when cesarean section is out of the question. The two last mentioned operations (forceps above the brim and prophylactic turning) will find their indication in such types of cases as a last resort to save the life of the child before craniotomy is resorted to (forceps when the head is fixed, turning when it is movable). On the whole, our aim should be to leave labors in contracted pelves as long as possible to the natural forces and failing then to perform only the operation which will most likely save both mother and child. All other operations should gradually be more and more limited. The patient must reach the expert in an absolutely aseptic condition without any obstetrical interference of any kind having been made. Until then, by a careful selection of cases, the percentage of danger should be reduced to a minimum."

I exhibit this chart and give Shauta's opinions because I believe they represent the acme of good judgment then and a model for emulation today. However, the young man of today following Shauta's philosophy must have the staunch backing of the general profession to survive. Every time he loses a baby he runs the chance of facing the tacit judgment of a large part of the general profession and the more vociferous judgment of the public that he should have known enough to have done a cesarean section in the first place. Of course, it is obvious that even with the greatest care, errors will be made, but Shauta's philosophy is more safe for the mother.

As a guide to the probabilities for spontaneous deliveries in various degrees of contracted pelvis, we have the figures of Dr. J. Whitridge Williams.[68]

TABLE II

True Conjugate	Spontaneous Ending
9. -10 cm.	77.28%
8.9- 8 cm.	61.54%
7.9- 7 cm.	33.33%
Under 6.9	0

"We believe that anything below 7 cm. should be an absolute indication for cesarean section with a live child. Relative indications, 7 or 7.5 to 8.5 for flat and 9 cm. for generally contracted pelves."

The question is often asked by physicians and laity alike: What is the comparison between the danger of normal delivery and cesarean section in the normal woman? Though, obviously, it is impossible to answer this question with accuracy because the answer depends on judgment, skill and chance, yet upon a studied and reasoned opinion as to the approximate answer to this fundamental question depends each man's measure of the philosophy, understanding and moral responsibility of any man who performs this operation without valid indications. It is not alone the question of the initial risk taken, but the assumption of responsibility for future risks. As C. Jeff Miller[42] expressed it:

> "The performance of cesarean section by no means terminates a surgeon's responsibilities. Once he has done it, he has charged to his account that woman's obstetric future, and he is responsible, at least morally, for what happens to her in her subsequent pregnancies. The scar is always a hazard as long as she is able to conceive, and since Gamble's disturbing investigation, we have no criterion by which to estimate its strength. The accident (rupture) is a possibility at any time after the sixth month and the intervention of one or several natural deliveries confers no form of immunity."

A study of reported figures is suggestive in providing an approximate answer to the above question.[32]

We may reasonably estimate 0.1 per cent, or one death in a thousand deliveries, as an irreducible minimum in maternal mortality in normal delivery. Shauta[57] reported a maternal mortality of .09 per cent in 4,116 spontaneous deliveries and Duncan[19] a maternal mortality of .11 per cent in 2,766 spontaneous deliveries.

Holland[29] reported a corrected mortality of 1.5 per cent in a series of 1,189 cesarean sections, practically all the classical type and performed before the onset of labor. If it be true that, had they been handled by low cervical cesarean, a 50 per cent reduction in maternal mortality might reasonably have been expected, we would have an estimate that cesarean section is still approximately seven times as dangerous for the mother as spontaneous delivery, even in the hands of a skilled operator.

DeLee[16] reports 1,875 low cervical cesareans from the Chicago Lying-In Hospital, with a maternal mortality rate of .96 per cent. Though these figures are large enough to minimize the element of chance, they contain other than elective cases. I doubt if the average man could come near them even in elective cases under the best conditions.

T. L. Montgomery, in a discussion of a paper by Clifford B. Lull[38] in 1931, says that 9,823 cesarean sections from various metropolitan areas in the United States show that the operation is nearly seven times more dangerous than normal delivery.

When indications are valid and the cesarean operation is not an elective, it is impossible to arrive at any general approximate comparison. Each case must be decided by a comparison of probabilities determined by individual findings, indications and contraindications, and the relative statistical results between cesarean section and other obstetrical maneuvers. It is of value, however, to compare the general cesarean mortality rate in this connection with the general mortality rate from all forms of delivery, at present approximately 4.1 per cent to 0.6 per cent.

Frederick C. Irving,[32] in his analysis of a six-year period at the Boston Lying-In Hospital, in an attempt to compare cesarean section with those forms of operative delivery with which cesarean section usually competes—that is, high forceps, craniotomy, version, breech extraction, and mid forceps—says:

> "Our mortality in cesarean section was about four times greater. On the other hand, cesarean section was

TABLE III.

Eclampsia	*Cases*	*Conservative Mat. Mort.*	*Cesarean Mat. Mort.*	*Fetal Mort.*	*Infant Mort.*
Stroganoff[62]	839	8.9%		22%	
Cragin[13]	50	12.0%			
Lichtenstein[36]	94	5.3%		21.3%	37.3%
Peterson[48,49]	530 (Vag. Ces.)		23.4%		
	500 (Abd. Ces.)		34.8%		
Last	243 (Abd. Ces.)		25.79%	10.69%	
1st. 5 convul.	60 (Abd. Ces.)		15.0%	2.54%	
Lichtenstein[37]	200	8.5%		16.9%	39.44%
Stroganoff[63]	2208	9.8%			
Williams[72]	275	10.5%	25.0%		
Lazard, Erwin, and Vruwink[35]		Mag. Sulph. intrav. 7.0%	36.0%		
Holland[29]	195		31.8%	32.0%	50.0%
Welz[67]	26		42.7%	19.0%	
Miller[43]	41		41.5%	14.7%	
Thompson[64]	46		28.3%		

TABLE IV.

	Active Treatment (Vag. Abd. Ces.)		*Bloodletting, narcotics*	
Fromme	*Cases*	*M. M.*	*Cases*	*M. M.*
1- 5 convulsions	46	8.7%	60	1.7%
6-10 convulsions	10	20.0%	11	9.1%
10-40 convulsions	2	50.0%	8	37.5%
	58	12.1%	79	6.3%
Freund				
1 convulsion	68	7.4%	11	0.0%
2 convulsions	56	5.4%	15	6.7%
3- 5 convulsions	120	15.8%	34	0.0%
6-10 convulsions	75	22.7%	12	8.3%
11-20 convulsions	34	29.4%	4	0.0%
21-56 convulsions	32	28.1%	3	100.0%
? convulsions	14	28.6%	2	0.0%
Pp. Ekl. convulsions	146	15.1%	13	0.0%
	545	16.3%	94	5.3%

TABLE V.

	Cases	*M. M.*	*F. M.*
Bill (1927)			
Cesarean section—no transfusion	27	11.1%	37.3%
Cesarean section with transfusion	40	1.78%	32.1%
Bill (1931)			
Older methods	2117	9.68%	57.4%
Cesarean section with transfusion	262	1.78%	32.0%
Siegel (1934)[58]			
Cesarean section with transfusion	101	.99%	24.75%

three times safer for the infant. In cases where there is a fair choice between pelvic delivery and cesarean section, one should consider well the increased risk to the mother, who is vastly more important than the infant, before one performs an operation which gives the baby an advantage, even though that advantage be three-fold."

Eclampsia

Twenty-five years ago we had ample statistics that pointed to the superiority of the conservative treatment of eclampsia over the use of cesarean section, except where the indication of disproportion or obstruction existed, and these statistics have been further corroborated year by year and rendered thereby more conclusive; and yet, the use of cesarean section in this condition has shown no abatement. Furthermore, though Stander[61] showed that ether, chloroform, nitrous oxide and ethylene produce changes in the blood constituents very similar to those seen in eclampsia, inhalation anesthesia has been most generally used in cesarean section for eclampsia.

Lichtenstein compared the two forms of treatment according to the number of convulsions that had taken place (Table IV).

TABLE VI.

	Cases	Cesarean M. M.	Obst. Treatment M. M.	Infant Mortality
Holmes[31]	2756		7.36%	54.1%
Complete	350		13.40%	80.0%
Incomplete	1022		4.30%	50.5%
Jewett[33]	2912		10.90%	57.3%
	95	11.50%		34.0%
Cragin[12]	49		8.10%	51.0%
Complete	14		14.20%	
Incomplete	35		5.70%	
Holland[29]	139	11.50%		27.3%
Hitschmann[28]	3035 (version)		6.30%	
	1095 (bag)		6.20%	85.0%
Momm	153	6.60%		14.0%
Findley[20]	27042		6.41%	57.43%
	4885	5.99%		24.45%
Gannsle[21]	93		8.60%	65.20%
	93	6.40%		6.40%
Bill[5]	2117		9.68%	57.40%
	262 (transf.)	1.78%		32.0%
Siegel[58]	101	.99%		24.15%
Aldridge and Parks'				
Woman's Hospital				
Marginal	61		1.6%	20.0%
	18	5.5%		5.6%
Partial	18		11.1%	35.3%
	28	3.6%		10.8%
Central	23		13. %	66.6%
	37	10.8%		21.7%
Sloane Hospital				
Marginal	113		1.8%	30.0%
	19	0.0%		0.0%
Partial	27		7.4%	55.6%
	5	0.0%		0.0%
Central	32		9.4%	84.7%
	19	10.5%		15.0%

Cesarean Section and Placenta Previa

In the treatment of placenta previa, cesarean section has come into greater prominence and rightly so, since Dr. Bill,[5] of Cleveland, in 1927 reported the results of prophylactic blood transfusion and section.

Comparative statistics between cesarean and non-cesarean treatment in placenta previa are shown in Table VI.

To my mind, cesarean section should be used in every case where no vaginal interference of any kind has taken place, the child is alive and viable, and the previa is complete. Also, in the incomplete varieties, under the same conditions of asepsis and viability, where the cervix is so long and undilated that one experienced in the insertion of the Voorhees' bag can predict a very difficult insertion with likely an increase in separation, and a very long labor.

In 236 patients who bled to death, Hitschmann[28] brought out the facts that:

50% died because of the previa itself.
33% died from tears in the uterus, due to the abnormality of the placental site.
3.7% died from atony of the corpus.
2.9% died from atony of the lower segment.
2.3% died from adherent placenta.

It seems logical that cesarean section should prevent these tears. However, when the previa is so marginal or lateral, and the cervix dilated to the point where the Voorhees' bag can be used with ease, or one can count on the descending head stopping the bleeding by merely rupturing the membranes, I feel confident that these methods of treatment are more safe for the mother than cesarean section. After delivery from below, the uterus, cervix and vagina should be packed. Fluids, intravenous glucose and blood transfusion, as indicated, are here just as important for good results as in cesarean section. To my mind the safety of the mother should be our sole guide in the choice of treatment, because it has been my experience that placenta previa babies are markedly under par, apart from their degree of prematurity and the blood loss of the mother.

The findings of Findley,[20] in an analysis of

TABLE VII.

	Cases	Maternal Mortality	Fetal Mortality
Dorman[17]			
Total	234 (Non-cesarean treatment)	5.1%	
Clinical	105	9.5%	
Totally concealed	15	20.0%	
Holland[29]	36 (Cesarean section)	11.0%	
	30 (Cesarean hysterectomy)	46.6%	
Bland and *Rakoff*[7]	414 (Expectant treatment)	4.1%	60.7%
	107 (Cesarean section)	11.2%	74.4%
	284 (Radical treatment)	13.4%	73.0%

47,828 collected cases of placenta previa, are important:

Incidence all types	.626%
Incidence central	.186%

"Low cervical cesarean is the procedure of choice in complete placenta previa and in other types presenting a closed cervix."

These figures extending from 1905 constitute an interesting tabloid history of achievement. In 1905, Dr. Rudolph Holmes, after an extensive study of cesarean section and placenta previa, summed up the situation by stating that cesarean section lowered infant mortality 30 per cent but increased maternal mortality nearly three-fold. Today, under careful selection, improved operative technic, and the adjuvantal use of blood transfusion and parenteral fluids, cesarean section would appear to be three times more safe for the mother than expectant obstetrical treatment and the same reduction in infant mortality obtains. This improvement could be more generally obtained if we could only learn to instruct women definitely to keep the vagina free from contamination from the sixth month on, and if we could only learn not to make vaginal examinations for purposes of diagnosis when bleeding obtains in the last three months of pregnancy. By the same token, if these two lessons were generally learned and strictly adhered to before and during every labor, it is my opinion that we would see a marked reduction in general maternal mortality. It has been my experience that the vaginal examination for purposes of diagnosis just before and during labor is necessary in only one in twenty cases. In the case where abdominal and rectal examination leave one in doubt, we should prepare for the vaginal examination as carefully as we would for a major obstetrical operation. The first consideration, if bleeding occurs in the last three months of pregnancy, should be immediate and continued hospitalization and the typing and cross-matching of donors who should be quickly available if occasion demands.

Cesarean Section and Premature Placental Separation

Premature separation of the normally situated placenta, as an indication for cesarean section, began to come into greater prominence after Couvelaire[9] in 1911 brought out the clinical entity designated by him as "apoplexie utero-placentaire." Dr. J. Whitridge Williams[69] made it more generally known to the profession in this country in 1915. Williams' attitude at that time holds, I believe, with equal force today, namely, that in the vast majority of cases, expectant treatment is the treatment of choice. In regard to cesarean section, he said:

> "The latter operation should be chosen only when the cervix is but slightly dilated or when the general condition of the patient is more serious than can be accounted for by the amount of blood that has escaped. In this event, the condition is probably complicated by concealed uterine or intraperitoneal hemorrhage."

If the uterus will not contract after the cesarean operation, of course it must be taken out.

The statistics of Dorman[17,18] in 1913, Holland[29] in 1921, and Bland and Rakoff[7] in 1938, bear out Williams' contentions (Table VII).

The better recent cesarean mortality statistics in this condition are due primarily to the more general use of sufficient amounts of blood transfusion and parenteral fluids and, secondarily, to the increased use of the low cervical operation. Immediate hospitalization and the procurement of compatible blood donors should be our first consideration at the first suspicion of premature separation. In questionable decisions between expectant treatment and cesarean section, the effects of blood transfusion may make it quite apparent that expectant treatment should be chosen. This is most important because statistics show that, when indicated, expectant treatment with adequate blood transfusion and parenteral fluids is approximately three times more safe for the mother than cesarean section. Observations will show that much of our preventable cesarean mortality, in both placenta previa and premature separation, is due to operating when infection can be reasonably suspected and to operating before bringing the patient out of shock by adequate blood transfusion and other restorative measures, and then failing to continue adequate blood transfusion and parenteral fluids where indicated.

TABLE VIII.

	Cases	*Maternal Mortality*
Reynolds (1907)[53]		
Before labor	82	1.2%
After a test of labor	158	4.0%
Late in labor	49	12.0%
Routh (1911)[54]		
Clean cases—		
A. Not in labor	245	3.6%
B. In labor, membranes intact	224	2.2%
Total	469	2.9%
Suspicious cases—		
C. In labor, membranes rupt.	166	10.8%
D. Frequent exams. or attempts at delivery	64	34.3%
Total	230	17.3%
Holland (1921)[29]		
Contracted pelves—		
A. Not in labor	1202	1.6%
B. Early in labor, within 6 hours	389	1.8%
C. Late in labor	220	10.0%
D. After attempts at induction	35	14.0%
E. After attempts at delivery	107	25.7%
Gordon (1928)[22]		
A. Not in Labor	343	3.5%
B. Early in labor	110	6.4%
C. Late in labor	403	7.7%
D. After attempts at induction	1	0.0%
E. After attempts at delivery	14	13.6%

Much of the preventable maternal mortality of today is due to errors in the choice of cesarean section and its improper handling in the four conditions outlined above. Some of these errors may be ascribed to a fairly equal balance of opinion and differences in the evaluation of statistical evidence. But there are two errors that one observes and encounters in statistical data that cannot be ascribed to an equal balance of opinion: (1) the performance of cesarean section without any demonstrable scientific indication; (2) the delivery by cesarean section of dead babies, and monstrosities, such as hydrocephalic and anencephalic babies, etc., demonstrable by x-ray, where obstruction from below does not preclude a reasonably safe craniotomy, or absolute maternal indications do not obtain. The permission of such practice is a reflection on the understanding and the sense of responsibility of the general staff of a hospital.

The factors conditioning the mortality of cesarean section are: time of operation in relation to the beginning of labor, condition of the membranes (ruptured or unruptured), freedom from vaginal examinations, freedom from previous attempts at delivery from below, and the type of operation chosen to meet existing conditions.

From 1907 on, we have had special studies showing the importance of the time factor. Table VIII is self explanatory.

Convincing histologic and bacterial studies have accumulated that explain this differential mortality.

In 1917, J. Whitridge Williams[70] reported a histological study of fifty uteri removed at cesarean section, and concludes:

> "The fact that inflammatory changes were present in 40 per cent of the specimens is very impressive and serves to demonstrate anew the danger of conservative cesarean section when performed at any other than the optimal time: namely, at an appointed date during the last days of pregnancy or within a few hours of the onset of labor in patients who have been examined only by those who observe an appropriate technic."

Again, Williams[71] reported in 1921 a critical analysis of twenty-one years' experience with cesarean section. In 183 cesarean sections, the mortality was 13 times greater in the first fifty than in the last 133. This was not due to change in operative technic but to avoidance of ascending infection by operating before the onset of or during the first hours of labor.

John W. Harris[25], in 1922, made a study of the results obtained in cesarean hysterectomies (Table IX).

TABLE IX.

Duration of Labor	*Total Spec.*	*Inflammatory Changes*	*Percentage*
Before or within 6 hours of labor	27	1	3.7
6-18 hours	5	4	80.0
Late 1st and 2nd stage	28	18	64.3

Harris and Brown[26] in 1927 made a study of the bacterial content of the uterus at cesarean section, with the following findings:

> "Uterus free of bacteria at end of pregnancy.
> "Uterus free of bacteria within 4 hours after onset of labor.
> "After six or more hours, bacteria could always be demonstrated in lower uterine segment.
> "Absence of vaginal examinations by no means insures that the uterus is free of bacteria.
> "Even intact membranes do not offer a thoroughly effective barrier to access of bacteria to the lower uterine segment.
> "Presence of normal temperature at time of operation cannot be accepted as a reliable sign that bacterial invasion has not already occurred."

All researches show the immense importance of the performance of cesarean section early in labor.

In addition to the above researches potential for the reduction of maternal mortality in cesarean section, we have had increaasing proof that the low cervical operation is far more safe than the classical.

In 1914, four years after his introduction of his low cervical operation, Opitz[47] reported 433 such operations without a death. This report was interpreted with balance by those acquainted with the natural hazards of supravaginal hysterectomy, with which it has certain steps in common.

In 1919, and again in 1921, Alfred C. Beck[3] gave great impetus to the performance of the low cervical operation in the United States and compared the relative advantages of the classical and low operations:

Classical

Shorter duration.
Ease of exposure.
Fewer technical difficulties.
Less troublesome delivery of the child.

Low Cervical

Better protection against hemorrhage, peritonitis and adhesions.
Earlier convalescence, and less risk of subsequent rupture of the uterus.

Beck reported eighty-three low cesarean operations with a maternal mortality of 3.4 per cent.

By 1921, Munro Kerr and Eardley Holland, in Great Britain, were convinced of the advantages of the operation and Holland[30] voiced the following conclusions in regard to his future choice between the operations:

> "My own future practice will be to employ the transperitoneal low segment operation for all cases, except where the lower segment is hard to get at, as in cases of shortness of the abdominal cavity accompanying diminutive stature or kyphosis (when the presenting part of the fetus is jammed down against the pelvic brim), and in fibroids."

The low cervical operation was further advanced by Dr. Joseph B. DeLee[15] of Chicago, who stressed the importance of the adjuvantal use of local novocaine infiltration anesthesia for the possible prevention of acidosis and pulmonary complications.

TABLE X.

DeLee[16]	*No. cases*	*M. M.*
City of Chicago 1934 (all causes)		
Classics	438	5.5%
Low cervical	541	2.0%
Germany (Winter) (all causes)		
Classics	438	6.4%
Low cervical	3554	3.7%
Chicago Lying-In 1914-1936 (all causes)		
Classics	168	6.0%
Low cervical	1875	.96%

Skeel and Jordan,[59] from a survey of 1047 cesarean sections in the Cleveland registration area, state: "Our estimate of the mortality of simple obstruction is 2 per cent for the classical operation and 1 per cent for the low cervical." They give the summation of reports and surveys of hospitals as shown in Table XI.

TABLE XI.

	No. cases	*M. M.*
Classical	3468	5.2%
Low cervical	2753	2.5%
Courtiss and *Fisher*[8]		
Classical	409	6.4%
Low cervical	376	1.33%
Irving, F. C.,[32] compilation of reports of 15 authors since 1930:		
Classical	3342	6.7%
Low cervical	2467	1.6%

Again, Gerald W. Gustafson,[24] in an eight-year survey of the cesarean sections at the William Coleman Hospital, says:

> "The greatest single factor in reducing maternal mortality (of cesarean section) has been cervical cesarean. It is reasonable to assume that if the low cervical operation could be substituted for the classical operation in this country, the mortality from abdominal delivery would be cut in half."

It seems strange that, with all of the accumulating data pointing to the marked superiority of the low cervical operation, the classical is still much the more frequently used of the two. The reason is likely that the occasional operator chooses the classical because it makes fewer technical demands.

With all of our increased knowledge based on verified data, the average operative mortality of cesarean section has been only slightly reduced since Routh's figures in 1911.

TABLE XII

Routh[54]:		
1891-1900	M. M.	16.5%
1901	M. M.	8.1%
1906-1910	M. M.	6.1%
Lynch[39] (1930-1937) (12,955 cesarean section)	M. M.	4.1%
Irving[32] (11,491 cesarean section)	M. M.	5.8%

This is a far cry from the possibilities suggested by the reports given in Table XIII.

TABLE XIII

Opitz[47]	433		M. M.	0.0 %
Greenhill[23]	108		M. M.	0.0 %
Arnot[2]	204		M. M.	0.0 %
Maxwell[41]	165		M. M.	0.0 %
Lazard[34]	289		M. M.	0.0 %
Seely[56]	87		M. M.	0.0 %
Phaneuf[50]	166		M. M.	.6 %
Daily[14]	500	(2 antemortem)	M. M.	.6 %
DeLee[16]	1875		M. M.	.96%
Courtiss and Fisher[8]	376		M. M.	1.3 %
Lazard[34]	507		M. M.	1.37%

Unfortunately, the average man is not impressed with average figures. He is guided more by the remarkable reports that are conspicuous and impressive from their very infrequency. He emulates these remarkable rates without emulating the factors of knowledge and skill that make these rates possible and without considering the factor of chance that enters into all statistics. Thus he has been led to increase his incidence tremendously. The incidence is now approximately ten times greater than it was in 1910. If one applies this increased incidence rate to the average mortality rates above, one can estimate that, where in 1910 there were 250 cesarean sections per every 100,000 hospital deliveries, we now have close to 2,500. If we accept Lynch's average mortality rate figure, this would mean that we now lose eighty-eight more women from cesarean section per 100,000 hospital deliveries than we did in 1910. If we accept Irving's figure, we lose 130 more women.

The rapid increase in cesarean incidence has been demonstrated in many researches.

TABLE XIV

Hawks[27] New York Nursery and Childs Hospital	1910	.3 %		
	1911	.2 %		
	1926	3.2 %		
	1927	2.7 %		
	1928	2.5 %		
Greenhill[23]	1916-1917	.6 %		
Chicago Lying-In	1928-1929	3.0 %		
Daily[14] Lying-In	1935	5.6 %		
Miller[44] Hartford General	1904-1911	.4 %	M. M.	16.0%
	1912-1916	1.4 %	M. M.	6.1%
	1917-1921	3.13%	M. M.	6.4%
	1921-1926	4.0 %	M. M.	2.8%

From the 1937 survey of the American College of Surgeons, MacEachern[40] gives the following figures of incidence:

PERCENTAGE OF CESAREAN SECTION

All hospitals considered	3.2%
Approved hospitals	3.0%
Non-approved hospitals	5.0%

Acting upon a foundation of even average understanding, judgment and technical ability, it is not to be wondered at perhaps that increasing reports of greater and greater incidence from recognized centers should lead men to question the wisdom of their past conservatism when they reviewed the many prolonged labors, difficult forceps, and versions that had caused them infinite anxiety and exhausting work, even though the outcome had been satisfactory for mother and child, and to question even more their wisdom in their unsuccessful cases as regards the life of the child. Again it is not surprising that when physicians not practicing obstetrics hear or read of such results as those of Opitz and others who report a long series with few if any deaths, they are led to believe that now cesarean section must be a comparatively safe operation. This belief is strengthened by the markedly increased number of cesareans that are being performed. This increased incidence has had a tremendous effect upon the public's idea of the safety of the operation. That the public has more and more come to believe that cesarean section is only another way of having a baby is evidenced by the increasing number of women who come in and ask for a cesarean and are surprised when their demand is refused on the grounds of their normality and the increased danger involved. They had thought their only problems were to decide which way they wished to have their baby and then to choose their surgeon. The increasing number of their friends who had had cesareans had led them to believe that little danger must exist, likely due to advances in surgical knowledge. These women have no way of evaluating the normality of their friends or the indications that determined the operations. This misunderstanding of the public is often embarrassing when one is taking great pains to refer a patient to some safe conscientious obstetrician in the community to which she is moving and she tells you that her friends have advised her to go to a remarkable obstetrician who is so skillful that he delivers most of his patients by cesarean section.

The tremendous and continuing variation in incidence of cesarean section has been well brought out in the literature:

TABLE XV

			Incidence
Mosher (1927)[45] Quotes Tottenham's recently collected data.	Jefferson Hospital Philadelphia	1- 6	16.66%
	Boston Lying-In	1- 12	8.33%
	Bellevue Hospital	1- 97	1.03%
	Johns Hopkins Hospital	1-125	.80%
	New York Lying-In	1-285	.35%
	Swedish Hospital, Minneapolis	1-418	.24%
	Minneapolis General	1-671	.15%
	Toronto	1-861	.12%
Plass (1931)[52]	Smith of Indianapolis reports	1- 19	5.20%
	Tiber, Minneapolis and St. Paul	1-385	.26%
New York Acad. of Medicine. (1933)[46]	Hosp. 1. 1,000 cases per year	1- 19	5.30%
	Hosp. 2. 1,000 cases per year	1-150	.40%
Lynch (1937)[39]	13 physicians, 1,229 deliveries.	1- 7	13.50%
	13 physicians, 1,229 deliveries.	1-615	.16%

These figures suggest that we should carry out some procedure in our hospitals that would tend to minimize the errors of each group.

Other evidence that points to this same conclusion is the variation of incidence in ward practice and private practice (Table XVI).

TABLE XVI

	Incidence	Maternal Mortality
Hawks[27]		
Ward patients, 11,640	1.2 %	2.8%
Private patients, 7,515	3.8 %	3.5%
Miller[44]		
Ward patients, Dr. A.	2.62%	
Private patients, Dr. A.	23.25%	
Ward patients, Dr. B.	1.59%	
Private patients, Dr. B.	10.0 %	

Such evidence, even after making allowances for the variants in the differential incidence in ward and consulting practice, suggests that there must be some conditions inherent in private practice that make for poorer judgment and poorer results. One plausible reason for this situation is that increased anxiety and fatigue, not bolstered by sufficient consultation, stampedes the physician in his private capacity into choosing cesarean section unwisely where, were he rested and consulting himself, he would advise against it.

The most conclusive evidence that we should make a determined effort to make our hospitals safe for the parturient woman was brought out by the surveys of various cities and the mortality study of fifteen states.[66] Of these surveys, one of the first was that of Welz[67] in 1926. Welz brought out that in twenty-two years in Detroit this operation increased at a rate over seven times as rapid as the increase of population and that in Detroit the danger of cesarean section was twenty times greater than in all types of delivery, a mortality rate of cesarean section in 1925 of 13 per cent as against .66 per cent.

The comments of the Advisory Committee of the Fifteen States' study were:

> "The very fact that cesarean section was done on one-fourth of all the women who died following operation for delivery suggests that there had been unwise selection of the cases for operation or of the types of operation, or both, as cesarean sections constitute only a small percentage of all operative deliveries in general.
>
> "The most frequent indication for the cesarean section was some toxemia—in many cases eclampsia. Although the mortality from eclampsia in cesarean section cases is known to be higher than those treated conservatively, the fact was apparently not appreciated.
>
> "Many of the cases resulting in death from hemorrhage were equally mismanaged. In many cases the operation was done after great loss of blood when the patient was in shock and without transfusion or other treatment for shock.
>
> "Local anesthesia was used in surprisingly few cases.
>
> "The tremendous mortality attending cesarean section throughout the United States warrants a careful review of the indications and the choice of operation.

> "The New York Committee[46] found that 19.8 per cent of all deaths, exclusive of abortion and ectopic, were preceded by cesarean section.
>
> "The fact that the operation resulted in 80.1 per cent live babies, as against 59.7 per cent by other methods, led the Committee to conclude that this preponderance of live babies may be due to the tendency to accept fetal indications as valid for the performance of cesarean section and to hold the outcome for the fetus of greater importance than that for the mother.
>
> "The Committee judged only 18 per cent of the deaths from cesarean section as not preventable. The great majority of the remainder were the result of faulty judgment and lack of skill on the part of the operator. The incidence was 2.2 per cent.
>
> "This immoderate use of so dangerous a procedure is traceable to a variety of influences. The lack of appreciation of the surgical demands of the procedure itself, the unwarrantable widening of indications, and the possible use of the operation merely because of the desire on the part of some physicians to increase their surgical experience, are all contributory.
>
> "The use of the classical type should be limited to the elective operation.
>
> "Sharp reduction in the number of cesarean sections performed is to be strongly recommended. Only by this definite narrowing of its use to the legitimate occasions demanding it, as well as the provision of capable operators, can a decrease in these deaths be achieved."

The findings of the Philadelphia Committee[51] were essentially similar.

> "The incidence in hospital deliveries was 2.58 per cent; maternal mortality, 5.52 per cent. 34.4 per cent of the deaths following operative deliveries were preceded by section. In all hospitals (fifty-five), 28 per cent of the deliveries were operative. The death rate per 1,000 deliveries was 9.1 per thousand; 1.03 deaths per thousand were due to cesarean section. 62.2 per cent of the cesarean deaths were deemed to be preventable."

Many suggestions have been made as to the most effective solution of this problem.

Welz[67] strongly advised hospital supervision in 1927.

In the Twentieth Year Book of the American College of Surgeans, 1933, under Standards of the American College of Surgeons for Hospitals Taking Obstetric Patients, we find the following standard:

> "(6) : Frequent consultations encouraged on obstetric service, a consultation made obligatory in all cases where major operative procedures may be indicated."

This ruling was not very successful in stopping abuses. It was a crystallization of the routine procedure of every conscientious and well-balanced obstetrician, but it did not affect those for whom it was intended. Again, it was resented by many obstetricians because they felt that there were likely as many abuses rampant in major operations in the realms of other surgical specialties, and they did not like being singled out for special supervision. Again, consultation did not always safeguard, as many were, in the words of Hawks—"often merely politely agreeable." Abuses keenly resented by obstetricians on a private staff were passed over because the obstetricians hesitated, for very obvious reasons, to bring individual instances to the attention of the general staff. If a general surgeon was called in consultation and asked to operate, he frequently performed the operation relying solely upon the obstetrical judgment of the physician calling him in. At any rate, the ruling was ineffectual and in 1936, in the Section of Obstetrics and Gynecology at the annual meeting of the American College of Surgeons, Dr. Frank W. Lynch[39] of San Francisco, in a paper entitled "More Conservatism in Cesarean Section," made the following observations and suggestions:

> "Careful consideration should be given to the indications for and the contraindications of this operation, and the best method of performing it. Its application should be limited to those cases in which valid indications for its use exist. To achieve such consideration and consequent limitation, the American College of Surgeons should restate indications for cesarean section valid at the present time and instruct hospitals certified by the Board to permit the operation only after consultation with one of the chief obstetricians of the senior staff. Only by such means can the profession safeguard an operation which is at present a very dangerous procedure."

The latter ruling would work well in many hospitals. To my knowledge, for the past twenty-five years, it has been the unwritten rule that has been followed in the teaching hospitals of the University of Minnesota. However, its efficacy would always depend on the conservative tendencies of the senior staff members in any institution. From my observation and experience, it would not fit the mechanism of private practice in our hospitals.

Thompson and Krahulik,[65] this past year, suggested a hospital requirement of consultation when a labor extends over eighteen hours. Such a regulation, in conjunction with mandatory consultation before cesarean section at any time in labor, would have great merit, but from my observation it would still leave much to be desired, and I doubt if it would be carried out.

The best solution of the cesarean problem, to my mind, is contained in the Minimum Standards of the American College of Surgeons adopted in 1918. This is the provision—

> "3-b: that the medical staff review and analyze, at regular intervals, their clinical experience in the various departments of the hospital, such as medicine, surgery and obstetrics and the other specialties; the medical records of patients, free and pay, to be the basis for such reviews and analyses."

These reviews and analyses should not be left to departmental meetings and to pathological conferences, the attendance at which is not so large and general as at the regular monthly staff meetings. Let the character of the work in the hospital in all of its departments in turn be a matter of general discussion.

Certainly, in regard to cesarean section, this routine will improve the character of practice in the hospitals more than do the present valuable and necessary mortality reports. At present, if the patient lives, a cesarean section is deemed to be a satisfactory achievement by the physician and the staff, whether or not the operation were necessary, unnecessary, or clearly contraindicated, or the operation chosen were of an incorrect type. The provision should solve the problem through the power of the influence of the general staff. It is influential rather than regulatory. It will make for greater care on the part of physicians and consultants alike when they know that their decisions and operative technics will be the subjects of routine review and discussion by the general staff no matter what the outcome of the operation.

Such analyses in regard to cesarean section should bring out the following data:

1. Was there a consultation and, if not, why?
2. What were the indications?
3. If the indication was pelvic contraction, what were the findings of pelvimetry, Munro Kerr maneuver, or x-ray?
4. Was the child dead or alive at the time of operation?
5. Did an x-ray give any evidence of deformity (hydrocephalus, etc.)?
6. Was the section elective, or after a test of labor, and how long a test?
7. Were the membranes intact or ruptured; and, if the latter, how long ruptured?
8. Had vaginal examinations or attempts at delivery been made?
9. Was there any evidence of infection at the time of section?
10. What was the blood picture? If signs of anemia, acute or chronic, obtained, were grouped and cross-matched donors at hand and used if indicated?
11. If the indication was eclampsia, why was cesarean section chosen in preference to conservative treatment?
12. If the indication was placenta previa, what measures had been taken to differentiate between the complete and incomplete varieties, and were grouped and cross-matched donors at hand and used as indicated? Was shock combated before operation?
13. If the indication was accidental hemorrhage, what decided the choice and were donors likewise present and used if indicated?
14. What operative technic was used and why?
15. Was the child at term, premature, or postmature?
16. What anesthetic was used and why?

Such reviews and analyses, in conjunction with our mortality reports, would soon tell us the character of work that is being done in our hospitals, and, in addition, would indicate most rapidly and convincingly the errors to be avoided —whether they be errors of well-meaning conservatism or well-meaning radicalism. Discussion would quickly bring out abuses and general staff influence would tend to eliminate them more effectively than would set regulations.

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The progress of tuberculosis in the body is determined by many definite and variable episodes and many more indefinite or contributing factors involving both host and parasite. It is a "battle on many fronts" with the weakest points giving way before the "enemy attack." All classifications, from Bard and Piery down to the present, bear witness to the fact that tuberculosis has many end results leading to many diverse classifications. Sweany, H. C., Amer. Rev. of Tuber., 1939, 39.

CUTANEOUS MANIFESTATIONS OF SYSTEMIC DISEASE*

HAMILTON MONTGOMERY, M.D.
Rochester, Minnesota

A CAREFUL examination of the skin of the entire body and mucocutaneous orifices frequently may establish or confirm a diagnosis of various systemic diseases.[8, 14-21] It is impossible to consider all the cutaneous manifestations of systemic diseases, with many of which the internist is familiar. Thus, I need only mention the so-called exanthemata such as scarlet fever, the cutaneous manifestations of various vascular disturbances of the extremities such as occur in Raynaud's and Buerger's disease and so forth. I shall emphasize the diagnostic features of certain cutaneous conditions which are expressions of underlying constitutional disturbances. Treatment is described adequately in modern textbooks. References to controversial points of view are given in the bibliography.

It is important to keep in mind the structure and functions of the skin in order to appreciate the rôle which the skin plays in the general economy of the body.[1] The skin serves not only as a protective outer coat but also it is one of the most vital organs of the entire body. The rôle played by the skin in the regulation of body temperature through dilatation and constriction of its capillaries and through the action of sweating is well known. The skin also has to do with the water balance and the balance of various chemicals in the body. Thus, for example, there is a marked excretion of sodium chloride in the sweat after long bouts of fever from any cause. Also, the skin acts as a reservoir for the storage of glucose.

Unlike internal organs of the body, the skin is exposed constantly to changes of temperature and the effects of light which cause complex reactions in regard to the capillaries of the skin and also in regard to the physiochemistry of the skin.[5] The skin probably acts as a medium in adapting the vitamins to the use of the body through activation by sunlight. There is a close relation between carotene and vitamin A and melanin pigment; vitamin C and the content of copper in the skin; ergosterol, vitamin D, cholesterol and various sterols. Space does not permit us to dwell on the reticulo-endothelial system in the skin in its association with immunologic phenomena and various types of cutaneous tests in the diagnosis of local and systemic diseases of bacterial, chemical and allergic origins.

With the exception of cutaneous nevi and neoplasms of various types, local parasitic and fungous diseases and certain superficial infections and irritants, including various types of contact eczema, lesions in the skin are usually the expression of an underlying constitutional disturbance. Thus, even psoriasis, which for many years has been regarded as a purely cutaneous disease of unknown origin, has now been found to be associated in many instances with a definite type of rheumatoid arthritis beginning in the phalangeal joints, and in other instances it has been found amenable to treatment with large doses of vitamin D,[2] thus emphasizing both the systemic and the constitutional factors in this disease.

Pigmentation of the Skin

Addison's disease usually is associated with generalized pigmentation of the skin which is especially pronounced in the folds of the skin, axillæ, nipples, genital and perianal regions and often in the mucous membranes of the mouth. Microscopically, there is an increase of melanin pigment in the basal cells of the epidermis and in the chromatophores of the cutis.[10] Pigmentation of the skin may be the first sign of Addison's disease.

Acanthosis nigricans is a rare disease in which the distribution of pigmentation is the same as it is in Addison's disease. In addition, however, there are accentuation of the normal cutaneous markings and hyperkeratosis and verrucous and papillomatous lesions develop in the regions of pigmentation. The histopathologic picture reveals changes which are diagnostic. Acanthosis nigricans is of two types: (1) the juvenile type, which runs a benign course, and (2) the adult type, which, in the majority of cases, is associated with malignancy involving the abdominal or pelvic organs. Apparently the changes in the skin are secondary to some involvement of the chromaffin-sympathetic system.

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*From the Section on Dermatology and Syphilology, The Mayo Clinic, Rochester, Minnesota.

Hemochromatosis, or so-called bronze diabetes, also is associated with generalized pigmentation of the skin; the distribution of pigment is similar to that seen in Addison's disease. Clinically, the color of the skin seems to be composed of gray, blue and brown. Sometimes there is an increase of melanin pigment which masks the bluish-gray color and, when associated with a low blood pressure and symptoms of asthenia, results in confusion of it with Addison's disease. The diagnosis of hemochromatosis is readily established microscopically by demonstration of deposits of iron (hemosiderin) occurring in the propria of the sweat glands and at times these deposits of hemosiderin may outline the reticulo-endothelial system of the skin.

Arsenical pigmentation, resulting especially from the administration of pentavalent and inorganic arsenical preparations such as solution of potassium arsenite (Fowler's solution) or sodium cacodylate, presents a characteristic "raindrop" appearance together with associated keratoses on the palms and soles, which permit diagnosis on clinical grounds alone. Microscopic and histochemical studies will establish the diagnosis in borderline cases.

Argyria may result from local applications of preparations of silver to the mucous membranes, from ingestion of various silver salts, or from intravenous treatment with silver arsphenamines. Generalized argyrosis usually has a marked grayish hue that is diagnostic. As in hemochromatosis, however, there may be an increase of melanin pigment, which tends somewhat to mask the color. Microscopically, with darkfield illumination of a section stained with polychrome methylene blue, glistening refractile particles of silver are seen especially in the propria of the sweat glands but also throughout the cutis. These particles are uniform in size in contrast to relatively nonrefractile particles of bismuth, mercury and gold, which vary in size and are seen in cases of pigmentation after local applications or ingestion of these materials. Distinction between various types of pigmentation of the skin, due to heavy metals, also can be made by spectrophotometric methods as emphasized by Gaul and Staud.

Generalized melanin pigmentation of the skin is also seen in association with tuberculosis of the abdomen affecting the chromaffin system, in many cases of generalized scleroderma, dermatomyositis, ochronosis and in association with various disorders of the thyroid gland, ovary, pituitary body and the liver. Mention also must be made of diffuse melanosis secondary to metastasis (melano-epithelioma).[17] The distinction is based on concomitant findings. The same is true of residual melanin pigmentation that follows many dermatoses and the pigmentation which results from deposits of hemosiderin after various purpuric and vascular diseases. The peculiar yellowish appearance of the skin in cases of pernicious anemia is well known, but less so is the dusky, purplish-red color of the skin of the face, neck and extremities characteristic of polycythemia vera. Jaundice, carotinemia and xanthochromia need only be mentioned.

Localized melanosis of the forehead may be the first sign of lymphoblastoma. Accentuation of existing freckles is seen in association with various endocrine disturbances. Cold cream pigmentation of the face, which is the result of deposits of mercury or bismuth in the creases of the skin, is not an uncommon occurrence.*

Pruritus

The itching skin, with or without excoriations or urticaria, is a frequent manifestation of systemic disease. Pruritus that is caused by parasites, contact or atopic (allergic) dermatitis, dermatitis medicamentosum, and various other dermatoses usually can be distinguished by concomitant findings. Pruritus vulvæ et ani, when occurring in women at about the time of the menopause, frequently is amenable to suitable endocrine therapy and thus becomes of constitutional rather than local origin. It is important to recognize the general pruritus which is associated with a dry, asteatotic skin and with too frequent bathing, encountered especially among elderly persons, or the acarophobia which is associated with arteriosclerotic changes. Too often, however, a diagnosis of neurotic excoriations is made in cases in which careful clinical and laboratory studies would reveal the presence of a serious systemic disease. Cutaneous pruritus frequently is associated with various endocrine disturbances, especially hyperthyroidism, and with disease of the liver and genito-urinary tract, diabetes, internal malignancy and especially with lymphoblastoma.

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*See Sutton and Sutton for a concise capitulation of local and general pigmentations of the skin.

Lymphoblastoma

Under the term "lymphoblastoma" are included mycosis fungoides, leukemia cutis (lymphatic, myelogenous, or monocytic in type), Hodgkin's disease and lymphosarcoma.[8,16] Mycosis fungoides is primarily a cutaneous disease; yet any of the other lymphoblastomas may have a primary (autochthonous) cutaneous origin, although they usually are secondary to metastasis or extension from within. Mycosis fungoides is characterized by infiltrative plaques or tumors presenting a gyrate or circinate arrangement. The other lymphoblastomas may simulate the clinical appearance of mycosis fungoides or may appear as discrete plaques, nodules or ulcers in the skin. In all types, exfoliative dermatitis is a common occurrence. More than a third of the cases of generalized exfoliative dermatitis occurring among patients more than forty years of age are due to one of the lymphoblastomas. Multiple types of lymphoblastoma may occur simultaneously in the same patient or the onset may be that of mycosis fungoides or leukemia cutis with the terminal picture of Hodgkin's disease or lymphosarcoma.[8,16,21]

Various authors list nonspecific and specific cutaneous lesions as occurring in 10 per cent to more than 40 per cent of cases of various types of lymphoblastoma. A toxic, nonspecific and, in most instances, generalized pruritus is seen, especially in cases of Hodgkin's disease. Other cutaneous manifestations of lymphoblastoma, specific or nonspecific in type, include eczematoid, psoriasiform, urticarial, herpetic, bullous, purpuric, hemorrhagic lesions; indurated ulcers; dystrophic changes in the nails and hair; localized regions of elephantiasis; various types of lesions of the mucous membranes and a localized or generalized increase in pigmentation of the skin. Herpes zoster is not an infrequent manifestation of a lymphoblastoma, especially of Hodgkin's disease, but it also frequently occurs among elderly individuals as the result of pressure or involvement of the posterior nerve roots by an internal malignant lesion of any type. The histopathologic picture of mycosis fungoides is distinctive. The cutaneous, microscopic picture of the other lymphoblastomas simulates that seen in hemocytologic studies. Correlation of cutaneous, general, clinical, roentgenologic, pathologic and hemocytologic studies is often necessary in order to make a diagnosis of lymphoblastoma or to determine its type.

Metabolic Disturbances of the Skin

It is not recognized generally that cutaneous xanthoma is usually a manifestation of systemic xanthomatoses involving various organs in the body.[13,14] It is important to distinguish between the different types of cutaneous xanthomas because of the varying prognosis and response to treatment. The most common type, xanthoma tuberosum, is characterized by multiple, yellowish to brown nodules or plaques that predominate on the extensor surfaces and are associated with hyperlipemia and hypercholesterinemia. In more than 40 per cent of the cases there is evidence of severe cardiovascular disease, especially angina pectoris and intermittent claudication. Involution of the cutaneous xanthoma frequently results following an animal fat-free diet. Disseminate xanthomatosis is characterized by multiple, fine, papular lesions and plaques involving the flexural surfaces, especially the axillary folds, the mucous membranes of the mouth, pharynx and larynx and frequently the face. Tracheotomy or laryngotomy may be necessary because of obstructive phenomena. The concentration of lipoids in the blood is normal or subnormal. The condition frequently is associated with diabetes insipidus. Improvement in the condition does not occur under any dietary regimen. Xanthoma of the eyelids may be associated with either type of xanthomatosis mentioned; even in a series of cases in which xanthoma was limited to the eyelids there was evidence of a definite but moderate hyperlipemia in 80 per cent of the cases, and systemic disease, especially cardiovascular disease, frequently was present. Cutaneous xanthoma not infrequently is seen in association with various types of hepatic disease[20] or with diabetes. The microscopic picture in all these types is typical and is characterized by the presence of foam cells or xanthoma cells laden with lipoids.

Mention also must be made of so-called xanthic tumors of the tender sheaths and unusual forms of cutaneous xanthomatosis, such as nevoxanthoendothelioma, lipoid proteinosis (phosphatide lipoidosis) and necrobiosis lipoidica diabeticorum.[6] Cutaneous xanthoma has been described in cases of Hand-Schüller-Christian disease, in Niemann-Pick's disease (having to do with metabolism of phosphatides) and probably will be described in the future in relation to Gaucher's disease (having to do with cerebrosides, especially kerasin). Disturbances in lipoid metabolism, including hyperlipemia and increase in cholesterol or phosphatides in the blood, also may occur, independent of any cutaneous manifestations, especially in various types of hepatitis and nephrosis and in myxedema.

A localized type of amyloidosis is seen in the form of lichenified plaques which usually are limited to the skin of the lower extremities. Systemic amyloidosis,[7] on the other hand, is a rare and fatal disease which first may manifest itself by the appearance of yellowish papules in the skin of the eyelids, face and oral mucosa. There is diffuse nodular involvement of the entire skin, mucous membranes and the walls of the larger blood vessels of the body, associated with a Bence-Jones proteinuria but without definite evidence of myeloma. Amyloid takes on a pinkish-red stain when a Congo red dye is used and therefore one may make a test by the subcutaneous injection, in vivo, of a 1 per cent solution of the dye in the vicinity of suspected deposits of amyloid.

In myxedema there are dryness and scaling of the skin and puffiness of the entire surface of the body. Microscopically, deposits of mucin are found in the cutis and in the subcutaneous tissue. O'Leary has described a form of localized myexdema that is characterized by the appearance of nonpitting, edematous, tawny plaques on the lower extremities. The condition is associated with the paradoxical symptoms of acute hyperthyroidism of a moderately severe degree. Microscopic examination reveals excessive deposits of mucin throughout the skin.

Various cutaneous manifestations also are seen in association with hyperthyroidism, Cushing's basophilic pituitary adenoma, tumors of the suprarenal cortex and disturbances of the ovaries and gonads. These consist chiefly of disturbances of pigmentation in the skin, hypertrichosis and development of acneform lesions.

Deposits of calcium that appear in the skin as localized plaques or as part of a systemic process may be a frequent manifestation of severe, generalized scleroderma.

Photosensitization

There are several rare dermatoses in which there is a hypersensitivity to light of various wave lengths. There are at least three conditions which should be mentioned. Xeroderma pigmentosa[15] is a familial disease that is characterized by hypersensitivity to light and by spotted pigmentation of the exposed surfaces of the skin, senile skin changes and a marked tendency toward the development of basal-cell epitheliomas. In cases in which the condition is mild, it may be mistaken for ordinary freckles or lentigines. The affected individuals must be protected from exposure to the sun, either by application of protective creams or by shunning the light absolutely.

Pellagra is characterized by dermatitis limited to the exposed surfaces, by gastro-intestinal symptoms (diarrhea) and by a variable degree of dementia. There is marked pigmentation of the skin. The disease is associated with dietary deficiency, including a vitamin deficiency. Various types of vitamin deficiencies may result in changes in the skin, especially in dryness, hyperkeratosis and disturbances in pigmentation.[4]

In cases of lupus erythematosus there is a very definite sensitivity to light which must be kept in mind when treating patients who have this condition.

The administration of sulfanilamide or similar preparations frequently renders a person photosensitive so that either a generalized dermatitis or an erythema and dermatitis may develop and may be limited to the exposed surfaces, simulating a picture of disseminate lupus erythematosus or pellagra.

Infections

I wish to mention only a few of the numerous infectious diseases of the skin which are associated with systemic manifestations, or vice versa. These conditions may manifest themselves in the skin in the form of urticaria, erythema multiforme, bullous lesions, nodules, ulcers and granulomas.

Erythema multiforme may be an idiopathic and possibly an infections process or it may develop as a toxic reaction after a major operation. I do not believe it is generally recognized, however, that a marked constitutional disturbance with a rise of temperature to 104 or 105°

F. (40 or 40.5° C.) and extensive lesions like those of erythema multiforme may develop among patients sensitive to various drugs, especially after the ingestion of any of the large group of barbiturates and coal tar derivatives.

Of the granulomas, I wish to refer briefly to only two diseases. Blastomycosis, which is endemic in the Middle West, may be limited to the mucocutaneous junctions of the mouth and nose.[11] In these situations the lesions usually lack the verrucous borders and characteristic miliary abscesses and they appear simply as indolent, pyodermic or furuncle-like lesions. One can still readily demonstrate the budding organisms, however, in potassium hydroxide preparations. Systemic blastomycosis may first be manifested by small, multiple, cutaneous abscesses scattered over the skin of the body. Blastomycosis must be distinguished from torulosis, coccidiodal granuloma and sporotrichosis, as well as from tuberculosis verrucosa cutis and bromoderma.

Tuberculosis of the skin occurs in various forms which it is important to recognize from the standpoint of prognosis and treatment. There is a primary, cutaneous, tuberculous complex similar to the Ghon tubercle in the lung.[9,12] This usually occurs among children. In the beginning there is a nonspecific nodule or pyodermic lesion on the skin which may simulate a chancre. The tuberculin reaction is negative and there is no evidence of systemic tuberculosis. Within a few weeks lymphangitis and enlargement of the adjacent lymph nodes occur together with the development of a positive reaction to the tuberculin test with or without evidence of systemic tuberculosis. Among persons who already have tuberculosis, subsequent inoculation of the skin, either from within or from exogenous sources, usually results in the formation of an anatomic tubercule (tuberculosis verrucosa cutis). Other types of localized tuberculosis, which spread by continuity or contiguity of tissues and by secondary lymphatic dissemination, include lupus vulgaris, tuberculosis cutis orificialis and tuberculosis cutis colliquativa (scrofuloderma). Scrofuloderma represents an extension to the skin from an underlying tuberculous focus usually occurring in a lymph node or in a bone. Different localized types of tuberculosis differ in their response to treatment.

Among the hematogenous types of tuberculosis there is, first, tuberculosis cutis miliaris acuta generalisata, seen in infancy or early childhood, and terminating fatally; second, a large group of relatively benign hematogenous forms of tuberculosis occur as a rule among adults. These include lichen scrofulosorum, papulonecrotic tuberculids, tuberculosis cutis follicularis disseminata (lupus miliaris disseminatus facei and rosacea-like tuberculid of Lewandowsky) and third, various forms of tuberculosis cutis indurativa, including erythema induratum, sarcoid of Boeck, sarcoid of Darier-Roussy and lupus pernio. Space does not permit a description of all these various types of lesions. In cases of sarcoid of Boeck there are multiple, indurated, brawny nodules in the skin associated with fibrosis in the lung and fibrocystic changes, especially in the bones of the terminal phalanges. The reaction to the tuberculin test is usually negative. This condition is also known as lymphogranulomatosis benigna or Besnier-Boeck Schaumann's disease.

Comment

A careful examination of the skin is of value to the internist in the diagnosis of many systemic disorders and, conversely, the dermatologist must seek the aid of the internist and various laboratory procedures in the diagnosis and treatment of many dermatoses.

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INTUSSUSCEPTION OF THE SIGMOID

HARRY F. BAYARD, M.D.
Assistant in Surgery, University of Minnesota Medical School,
Minneapolis, Minnesota

INTUSSUSCEPTION occurs at several different levels in the gastro-intestinal tract but is chiefly thought of as a lesion to be considered in differential diagnosis of an acute abdominal condition in children under one year old. In adults and older children, intussusception of the ileum into the colon is seldom seen, but other areas of the gastro-intestinal tract do participate in such a catastrophe at times. C. W. Mayo,[2] writing in 1934 on chronic intussusception in the gastro-intestinal tract, states several levels at which intussusception was found, the sigmoid being the most frequent offender. Ten of the cases reported in his series were intussusceptions of the sigmoid and all ten were associated with a tumor of the pelvic colon.

It is true that in adult life, colonic intussusception is frequently predicated upon the basis of a tumor within the lumen of the colon. A long mesentery and inadequacy of the supporting ligaments of the pelvic floor, together with the presence of a sigmoidal tumor, are mechanical factors making adult intussusception possible. A colon contraction wave gripping a tumor within the lumen pushes the tumor area ahead and the invagination process is started. The length of mesentery by which this segment of colon is attached to its supporting structure and the laxity of the perirectal ligaments appear to be the only limiting factors in staying the invagination.

The character of the tumor apparently plays no rôle in this development but its gross anatomy does. A polyp which has a fairly long pedicle is more prone to initiate invagination than a sessile tumor, and likewise the size or bulk of the tumor influences the possibility of intussusception. Because of the fact that the sigmoid is a relatively frequent site for both carcinomata and polyps and also because of the long mesentery with which this segment of colon is often equipped, it is to be expected that the sigmoid will be the most frequent location for such an occurrence as intussusception.

The entire intussusception may and often does occur as one single event, but at times it would seem that it must be a progressive condition. If the first invagination is quite limited, it may well be that an increasing length of bowel becomes involved until some mechanical factor limits its progress. Histories of occasional proved cases of intussusception of sigmoid into the rectum would indicate that such is oftentimes the case. Such an intussusception may reduce itself or be reduced by the position assumed by the patient and later recur. Moderate degrees of this are infrequently seen through the sigmoidoscope and at times seem to be of no serious consequence to the patient.

Symptoms of this condition depend on the amount of sigmoid involved and the length of time the invagination has existed. Pain in the pelvis and rectum is invariable but the pain may be present a few hours and later disappear, suggesting, of course, that a reduction of the invagination has been effected in some way. Interference with normal bowel habits is expected and a partial obstruction does supervene. Passage of large amounts of flatus but no stool is frequently the story told the physician. Bleeding is uncommon unless the intussusception persists for a long period. A patient of mine presented this symptom, but in this case there was a protrusion of the intussusception through the anus with an impaired circulation in the protruding mass.

Treatment.—The treatment must take care of the immediate emergency, and, secondly, must accomplish an eradication of the factors which brought about the intussusception. Usually, if the invagination is not too extensive and edema of the invaginating segment is not marked, a reduction may be effected in the cases where a tumor is absent, by giving an enema with the patient in the reclining position and the hips elevated. If the enema is of barium, the patient may be placed under fluoroscopic control and the reduction process visualized. Oftentimes in moderate intussusceptions of this type, a reduction may be effected by putting the patient on a proctology examination table, that is, in an inverted position, and introducing air under slight pressure through a sigmoidoscope. If due caution is used in the amount of pressure with which the air is forced in, this procedure is safe, and when effective, it is an easy way out of an emergency.

In patients on whom a reduction is not possible from below, an abdominal section is to be urged at once, rather than allowing a delay in the hope that the patient will accomplish a reduction himself in the course of shifting his position about in bed. The reverse is more apt to occur, that is, edema of the invaginated loop will become more extensive and the eventual reduction or other form of treatment made more difficult and dangerous.

If the abdomen has been opened for reduction of an intussusception, a plication of the mesentery may be done also in an effort to prevent recurrence. Two other surgical procedures have been used to correct anatomical defects which in certain cases seem to be of etiological significance. Excessive mobility of the sigmoid is at times overcome by stitching one of the longitudinal muscle striæ for a few centimeters to the fascia of the psoas muscle as it comes downward over the brim of the pelvis. In the second procedure strips of fascia lata are inserted underneath the peritoneum in a criss-cross fashion, suturing the fascial ends at the pelvic brim. In this manner the peritoneal floor is elevated and the pouch of Douglas obliterated. This higher and tighter pelvic floor gives some measure of additional support to the lower sigmoid and upper rectum.

Where no sigmoidal tumor is found, one of these devices will usually suffice, but in the event a tumor is present, it also must be dealt with and a multiplicity of methods is open for the choice of the surgeon here. The individual circumstances in each case must be judged and the method which can be adapted to the case in hand, used. Fulguration of polypi through a sigmoidoscope is satisfactory when the polypi can be reached and where biopsies have proved that malignant characteristics are absent. Fulguration of certain types of known malignant tumors may be advisable, but most of the proven ones are better suited to some type of resection. The circulation and amount of edema in the intussusception may dictate an immediate exteriorization of the sigmoid. Because of impairment of circulation of the invaginated sigmoid and the consequently high risk of doing an intra-abdominal type of resection, the so-called rubber band method was used on a case seen September 2, 1935. This type of treatment had been advocated and used as early as 1867, but until brought to the attention of contemporary surgeons by Dr. Mont Reid in 1933, it seems to have been abandoned. Since this report by Reid the method has been used for the treatment of rectal prolapse by Dr. Owen Wangensteen,[3] who reported one successful case in 1934, and Dr. J. K. Anderson,[1] who likewise reported one case in 1936.

Case Report

The patient under consideration in this report was a farmer, white, forty-eight years of age, with a past history entirely free of any noteworthy illnesses. His family history had no bearing on his present trouble. His immediate complaint was a large mass protruding from the anus. His family physician was called and he was sent to the hospital at once. Because of obstruction and impaired circulation of the protruding loop of bowel a temporary colostomy had been done at once. This was functioning well when I was first asked to see the patient September 4, 1935. Local exploration of the sigmoid mesentery at the time of the colostomy showed no palpable lymph nodes.

Physical examination showed a poorly nourished, anxious appearing white male of forty-eight years with evidence of recent loss of weight. The temperature and respirations were normal but his pulse was sixty beats per minute. He was completely edentulous. The heart and lungs revealed no change from normal. There was a double-barreled colostomy present in the left lower quadrant of the abdomen and neither the liver nor spleen was palpable. Protruding from the anus was a partially gangrenous loop of sigmoid. This loop extended eight inches beyond the anus and at the outer end of the loop was a tumor mass which measured

5 by 3 by 3.0 cm. and was somewhat ulcerated. Biopsy of the tumor showed a papillary type of growth. There was considerable irregularity of the epithelium which, however, did not show marked activity in growth, and there were few mitotic figures present. Microscopic diagnosis was papillary adenocarcinoma.

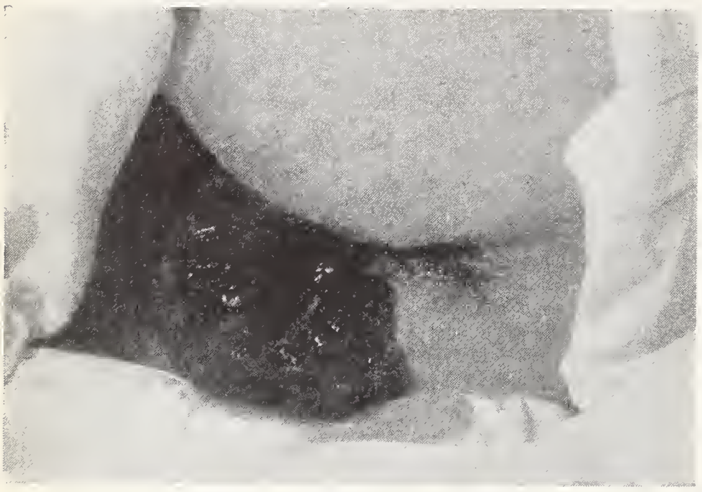

Fig. 1. Intussusception of sigmoid with protrusion of loop showing papillary adenocarcinoma of distal end.

A finger could be inserted between the sphincter and the protruding mass all the way around the loop so that the point of origin of the intussusception was determined as being at the point of reflection of the peritoneum off the anterior surface of the rectum, some 5 inches above the anus. The protruding loop of sigmoid was edematous, weeping mucus and felt cold.

It seemed probable that an attempt to pull this intussusception up into the abdomen through an abdominal incision would produce a ruptured bowel. The method described by Reid for treatment of rectal prolapse was decided upon as offering a reasonable chance of success. Accordingly, on September 11, 1935, under a light spinal anesthesia, a rubber tube 1.25 inches in diameter and of rather firm consistency was introduced into the lumen of the invaginated sigmoid and passed up several inches beyond the point of origin of the intussusception. The tube was anchored in position by passing a silkworm suture through it and the perianal skin after satisfying myself there were no loops of ileum caught within the thickness of the invaginated sigmoid. Several thicknesses of a heavy rubber binder were slipped about the outside of the invaginated sigmoid and passed upward to the point where the invagination started. This was some 5 inches above the anus. The effect of the tightly applied rubber binder against the resistance of the rubber tube and surrounding sigmoid was to shut off the circulation from the loop of sigmoid distal to the binder. It was also expected that during the time the binder was in position an anastomosis between the two thicknesses of sigmoid would be effected.

The protruding loop promptly became totally gangrenous and on the ninth postoperative day the entire loop had sloughed so that the rubber tube was then removed. The stump was rather thick and edematous but seemed to have a firm line of anastomosis. Hot boric irrigations and hot sitz baths were used daily until the large amount of mucous discharge ceased.

Because of financial stringency the patient was transferred to the U. S. Veterans' Hospital at Fort Snelling, on September 24, 1935. Examination six months later showed a scar at the point of anastomosis in the upper part of the rectum, but there was no decrease in the diameter of the lumen at this point to indicate that a stricture might form. The patient reported that he had experienced one episode two months after operation when there was a mild recurrence of his prolapse. This was reduced by his family physician at home and since then there had been no repetition of such an experience.

One year after this resection his colostomy was closed by a surgeon at the Veterans' Hospital and one year after this closure the patient again presented himself to me for examination. The rectum at the site of the anastomosis scar was still of normal diameter, the sphincter was perfectly competent and he claimed to have no variation from normal bowel habits. He was up to his customary weight and showed no evidence of recurrence of his malignancy.

The recorded cases treated in the manner described indicate a high degree of safety for the procedure, whereas the transabdominal resection for such a case would present a rather formidable risk. Provided due care is used in determination of absence of small bowel from the intussusception, there are no deterring factors to be considered. There may be some pain for a few hours after application of the rubber band, and likewise urinary retention may be troublesome for a short period, but no postoperative effects of any magnitude have been reported in any of the literature on this procedure. Because of this freedom from risk, the method should be given favorable consideration when one is confronted with such a lesion.

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PREVENTION AND TREATMENT OF INCISIONAL VENTRAL HERNIA*

DONALD W. JOHNSON, M.D.

Fairmont, Minnesota

EVISCERATION, or disruption of an abdominal incision, will not be considered.

Incisional hernia occurs frequently following laparotomies requiring drainage or when devitalization of the lips of the incision occurs. It is also seen too often following clean elective operations with healing by first intention.

The following features influence the reparative process: type of incision, duration of operation, presence of drainage, drainage material, condition of the patient, amount of retraction during operation, introduction of infection into wound from within or without, type of suture material, and allergy to catgut.

Midline incision is most favorable to development of ventral postoperative hernia. It is commonly the incision of choice with many operators as it furnishes a relatively bloodless approach to the peritoneum; perhaps it furnishes better exposure for structures bilaterally located. It is easier to close. The presence here of poor blood supply is conducive to sluggish healing and in the midline the support to abdominal contents is entirely fibrous, for the peritoneum, subcutaneous tissues and skin are non-supportive. We commonly avoid the midline incision in all except operations on the urinary bladder and the duodenopyloric area, utilizing the right or left paramedian incision with retraction of the intact rectus muscle outward, never incising through its fibers and nerves. This permits anterior and posterior sheaths of the rectus to be incised as two separate and distinct structures in the great majority of cases. The frequent impossibility of distinguishing between the posterior rectus sheath and the peritoneum causes no concern whatever. Immediately following suture of the posterior sheath and peritoneum the intact rectus is released and falls naturally without strain or undue tension over the suture line, protecting the injured peritoneum with a living physiologic splint adapting itself to every motion and requirement of the patient; tightening when he coughs or strains; transmitting the lines of force in a vertical direction against the intra-abdominal pressure. The anterior sheath is then sutured and splinting of the operative field is complete. The nerve supply of the rectus muscle is left without lasting damage and the structure of the muscle is practically uninjured. This incision is well adapted to operations on the biliary tract and to any operation below the umbilicus.

Prolonged operation with excessive exposure of cut tissue delays healing and favors infection. It is not possible to sterilize the skin, and culture of operative wounds usually shows bacterial growth despite towel protection and meticulous sterile technic. As the time element increases, the number of infecting organisms increases, the vitality of exposed tissues decreases, and the tissues become a more favorable culture medium for bacterial growth. Prolonged forcible retraction contributes to the traumatic devitalization of the tissues concerned. It is sometimes forgotten that only the defensive mechanism inherent in the patient prevents each operative wound from becoming grossly infected. Devitalized and thrombosed tissues favor the development of infection, delayed healing and a weakened abdominal wall, which may result in incisional hernia.

Drainage deliberately invites hernia by holding the divided abdominal wall mechanically apart, anl yet so beneficent is the healing process of nature that we can and do drain where indicated, and the incidence of hernia following drainage is very small compared with the number actually drained. Incidence of hernia may be reduced by placing one or more through-and-through silkworm gut sutures, mattressed or single, through the lips of the wound at either side of the drainage site. By through-and-through we mean through skin, fascia, muscle, and peritoneum. They are left untied or very loosely tied, protected by a rubber dam and collodion from contamination at their points of exit so that when the drain is finally removed they may be tied, bringing the lips of the draining sinus into apposition. They must be tied securely and the patient will appreciate 2 to 4 c.c. of evipal intravenously beforehand.

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Drainage material should be smooth and inert. Rough unprotected gauze should not be used. A rubber dam, coiled to a sausage-like mass (the familiar cigarette drain), or a sterile glove are excellent drainage materials, and traumatize the incision very little, as they do not adhere. Bile discharge is peculiarly apt to macerate and devitalize the incision, resulting in hernia. This can be minimized by the auxiliary sutures mentioned, plus constant suction on a set of Dakin's tubes introduced beneath the level of the peritoneum if large quantities of bile are being spilled. Constant mild suction can be obtained with an ordinary tonsil suction pump attached to a water faucet. The recovered bile can then be fed through a nasal tube to prevent depletion. This device protects the wounds in bile duct or urinary bladder operations equally well.

Infected wounds do not heal well. Healing in presence of infection is marked by scar tissue formation in the final stages of the process and scar tissue cannot be said to have the properties necessary to formation of a strong, firm abdominal wall. The principles of asepsis are well known. It must be borne in mind that a wound may be infected by careless spilling of bile, gall stones, urine, stomach or intestinal contents or by dragging an infected appendix or a pus tube across the lips of the wound.

Healing power of weakened anemic patients or those emaciated through long continued disease or neglect is less than that of a strong healthy individual. Such individuals should be built up if possible before operation. In many cases it is possible to spend a week or ten days in this endeavor and the result is well worth while as measured by increased tissue resistance and healing power. This is especially true in prostatic cases with retention and cystitis. The condition of the patient can almost always be improved by intravenous dextrose and saline, blood transfusion and forced feeding when possible. This applies especially to patients with cancer. A liver well stored with glycogen puts the patient in much better condition to withstand operative shock and produce new tissue. A weakened myocardium is much strengthened by 50 per cent dextrose in 100 c.c. doses twice daily preoperatively. Diabetics must be maintained sugar-free or healing will be sluggish.

It is widely believed that postoperative retching and straining are productive of incisional hernia. From our experience we are unable to concur with this, in the presence of the paramedian incision, unless drainage has been used. These unpleasant sequelæ may be largely prevented by careful preoperative preparation, the substitution of volatilized for unvolatilized ether, free use of duodenal suction tube, morphine in ⅙ grain doses every four hours during the immediate postoperative period, and more frequent use of local or spinal anesthesia.

Suture material in the tissues is a foreign body and this applies to all forms of suture. We have a patient still discharging catgut following breast amputation twenty years ago. Whether one type of suture material is more conducive to hernia than another is problematical in view of recent findings. Silver wire is the least offensive. The wire must be introduced through-and-through and be carefully placed so as to approximate the layers of the abdominal wall or postoperative weakness will develop due to massive scar formation. Removal must not be attempted before the fourteenth day. Probably this material is best used in cases where incisional hernia seems almost certain, namely, in patients with large, fat abdomens, massive infections or poor musculature. The great majority of closures are done with catgut and this is very satisfactory. Continuous plain No. 1 is used in the peritoneum, employing only two knots; mattress or continuous chromic No. 1 (20-day) in the fascia; dermal, metallic clips or silk in the skin. If tension sutures are utilized, they should be through-and-through, of silkworm gut or silver wire. Knots are to be avoided as much as possible. We never use catgut larger than No. 1. There is evidence to show that allergy to catgut is occasionally present. It is rare, however, and usually results in evisceration rather than ventral hernia.

In closure, structures must be accurately approximated without interposition of tissue. Omental tags should not be included in the peritoneal line, and fat must be thoroughly cleaned off the fascia before the sutures are placed. Wide areas of fascia can be placed in position to unite by overlapping and imbrocating. This strengthens the wound tremendously. Where additional strength is required, mattress sutures should be freely used, although knots form a weak area in repair and are a potential source of infection.

Treatment

Many patients with incisional hernia are excessively obese, a factor against successful correction of the condition by reason of increased abdominal pressure and stretching of the abdominal wall. These unfortunates should be reduced for sixty days before operation. Original operative scars should be excised. Where the peritoneum is redundant it must be trimmed to permit snug peritoneal closure. This is time-consuming, as the bowel and omentum are usually adherent to the peritoneum and releasing adhesions is an endless task. It is essential to remove the peritoneal sac, as in correcting inguinal hernia. Flaps of fascia are then fashioned, allowing an inch overlap from each side if possible. It is most important to clean the fascial sheath so that no tags of fat adhere. The recti muscles are then mobilized. It is claimed that they contribute more stability and support of the abdominal wall than does the fascia. If the recti are insufficient, due to retraction or destruction, and if the fascia is inadequate, a vertical incision is made through the anterior sheath parallel to the midline and well toward the lateral edge of each sheath.

This permits expansion of the sheath and the underlying rectus, facilitating closure. The lateral incisions are left unsutured and do not contribute toward a weakened abdominal wall. Closure of muscle is done with plain mattress sutures, loosely tied. Fascial sheaths are closed with interrupted mattress sutures in large bites, never with continuous sutures. Chromic No. 1 doubled is the suture of choice in our experience. In all long standing cases when the defect is great and the abdomen large and pendulous, we use fascial grafts in addition to the above, taken from the iliotibial tract of the fascia lata, one half inch wide and as long as conformation permits. They are transplanted immediately upon removal, being interlaced through the fascia closing the rupture. These grafts are utilized throughout the entire length of the hernial defect and as they grow they form a massive protection against recurrence. This is the method of choice in our experience, but the operation is long and tedious and the chance of infection is multiplied. Hemostasis must be absolute before wound closure and we drain each case with subcutaneous rubber tissue without gauze. Following repair the patient is snugly encased in a many-tailed binder and not permitted out of bed for fourteen days.

Case Report

(With Motion Pictures)

The patient was a woman, aged twenty-nine, height 5 feet 3 inches, weight 240 pounds, para 4. Three years ago she submitted to appendectomy through a midline incision, resulting in an incisional hernia upon which two unsuccessful surgical assaults were made before reaching our hands. Small bowel obstruction was in evidence. Her weight was brought to 220 in five weeks, whereupon repair of the hernia, measuring 8x5 inches, was undertaken according to the principles outlined above. The strangulated gut was released from massive constricting adhesions; flaps of peritoneum were constructed; the anterior and posterior rectus sheaths were isolated and dissected to form adequate healthy flaps. Many gallstones were present, but these were not molested. The peritoneum, posterior and anterior sheaths were overlapped and imbrocated, respectively. Three strips of fascia, each ½ inch wide and 12 inches long, were taken from the iliotibial tract of the right thigh and immediately interlaced throughout the closure of the ventral hernia, thus transplanting a strip of fascia 36 x ½ inches. Narrow rubber strips were placed subcutaneously throughout the entire length of the abdominal and thigh incisions. Forty-eight hours postoperatively, the patient developed a severe bronchitis with a tremendous cough which we were only partially able to control. Despite this major complication the wounds healed firmly without sloughing of the transplants and she now possesses a firm, strong abdominal wall. In all such cases the fascia lata must be carefully closed or disabling hernia of the vastus lateralis will result.

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"BENIGN" LYMPHOCYTIC MENINGITIS*

J. E. SKOGLAND, M.D.
Minneapolis, Minnesota

IN 1925 Wallgren[20] described, under the title "Acute Aseptic Meningitis," a self-limited benign inflammation of the meninges which occurred in Sweden. Since that time, many confirmatory articles have appeared both in the European and American literature under various titles such as acute lymphocytic meningitis, benign idiopathic serous meningitis, acute serous meningitis, benign aseptic purulent meningitis, epidemic meningitis serosa, benign lymphocytic meningitis, lymphocytic choriomeningitis and benign lymphocytic choriomeningitis. As has been frequently pointed out, it is still questionable whether all the cases reported were actually examples of the disease; however, they corresponded essentially to the clinical syndrome described by Wallgren.

In 1929, Krabbe[12] selected eleven cases which had recovered from what was supposedly tuberculous meningitis; he believed these cases to be fairly classical examples of aseptic lymphocytic meningitis. During the following year, Andersen and Wulff[2] reported a follow-up study of thirty-five cases. In two of these, signs of chronic encephalitis had developed which led the authors to believe that this syndrome was produced by the virus of epidemic encephalitis, which at times showed a predilection for the meninges. During this same year, Gunther[10] summarized the literature on this subject, recording 100 cases, of which thirteen were his own. Of the latter, two showed mild sequelæ, which suggested to him a possible relationship of this illness to poliomyelitis. The possibility of this same relationship was considered by the French authors and was expressed in a publication by Roch, Martin and Monedjikova.[14] In 1931, reports by Eckstein[8] and Schneider[15] again drew attention to the idea that a relationship existed between this syndrome and epidemic encephalitis.

The first reports in the American literature were published in 1929 by Viets and Watts.[18] Since that time, the interest in this syndrome has become widespread in this country, and cases have been reported by numerous investigators (Gager,[9] Dickens,[7] Bloedorn,[6] Viets and Watts,[19] Abramson[1] and Hammes[11]). In 1934, Viets and Watts[19] published their third series of fourteen cases, one of which showed some residual involvement of the central nervous system.

By far the most extensive work on this subject, at the present time, has been carried out by Armstrong and his co-workers[4] of the National Institute of Health and by Rivers and his co-workers[13] at the Rockefeller Institute. Both groups of investigators have followed large numbers of individuals suffering from this ailment and have succeeded in isolating a virus as a causative agent in at least one group of these cases.

Briefly, the symptomatology of this condition has been characterized by its acute onset, its nonpurulent character, and its localization in the meninges; hence, the name acute aseptic meningitis. It often begins as an infection of the upper respiratory tract associated with a mild headache, nausea and vomiting, and slight elevation of temperature. Meningeal symptoms soon follow, manifested by stiffness of the neck and a positive Kernig's sign. Occasionally, in the more severe cases there may result a delirium, convulsions and even stupor. The cranial nerves are usually not involved, and the neurologic examination is negative.

The disease runs a benign course for about ten days, with the temperature declining by lysis. Recovery is usually complete without residuals of any kind. In the mild cases, the temperature may not rise over 100° F., and the patients are comfortable aside from a headache and a slightly stiff neck. The exceptional case, however, may persist for a long period of time and definite signs of nervous tissue involvement may be manifested.

In general, the cerebrospinal fluid findings vary directly with the severity of the case. In the milder cases, the cells are few and exclusively lymphocytes, while in the more severe cases cells are very numerous and early in the disease may consist predominantly of polymorphonuclears. The spinal fluid pressure is usually normal. The proteins may be increased often to several times their normal values, while the spinal fluid sugar and chlorides have usually been reported as being normal. The serologic tests for syphilis are negative. The spinal fluid is sterile both upon direct examination and on the ordinary culture mediums.

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*From the Division of Nervous and Mental Diseases, University of Minnesota Medical School.

The disease appears most frequently during the fall months and most commonly involves the younger age group. No definite proof is available as to the contagiousness of this affliction. Contacts do not seem to contract the disease, and most of the cases reported have occurred sporadically. None of the investigators engaged in the experimental work has become ill. However, in 1936, Toomey[16] reported an epidemic of a disease resembling lymphocytic meningitis, occurring in an orphanage in Cleveland and affecting seventy-five individuals in a period of twenty-one days. It has been suggested by some investigators that this infection might be transmitted through the upper respiratory passages, but the mode of transmission is still only in the stage of speculation.

The diagnosis of this syndrome depends considerably on one's ability to rule out the presence of any other condition which might lead to a meningeal irritation, and to determine the absence of any other disease that characteristically involves the central nervous system. The most common conditions which might be confused with this syndrome are tuberculous meningitis, abortive types of poliomyelitis and an occasional case of the meningeal type of epidemic encephalitis. However, one must keep in mind that there are also numerous other conditions which may produce a meningitis of a lymphocytic nature and may often leave one in doubt as to the diagnosis of lymphocytic meningitis as a primary disease.

A helpful procedure in the diagnosis of at least one type of this illness has been made available since the isolation of a specific virus by Armstrong and Rivers in certain cases of lymphocytic meningitis. In these cases, specific antibodies usually appear in the blood stream about six weeks after the onset of the illness, and the isolation of these antibodies is of great value in substantiating the diagnosis in at least this single form of the disease.

On the basis of time of collection of the sera and the results of the neutralization tests, Baird and Rivers[5] proposed a grouping of the cases presenting this syndrome as follows:

1. If the blood contains no neutralizing antibodies at the onset of the illness but contains them after recovery, the case is definitely proved to be a lymphocytic meningitis caused by this virus.

2. If the serum has not been tested during the illness but shows neutralizing antibodies during convalescence, then one may only presume the case is one of this specific type of lymphocytic meningitis, since some individuals show these specific antibodies even though they present no history of any ailment of the central nervous system.

3. Finally, the absence of neutralizing antibodies after recovery from the illness merely indicates either that the syndrome was secondary to some other condition or that if primary it was not caused by the virus isolated by Armstrong and Rivers.

These groupings are of special interest since the etiology of this condition is yet in the investigative stage. Eckstein,[8] in 1931, injected cerebrospinal fluid from three patients ill with aseptic meningitis cisternally into each of three monkeys. One developed a paralysis of the limbs, and its cerebrospinal fluid showed a pleocytosis; the injection of spinal fluid from this animal into other monkeys produced similar changes.

In 1934, Armstrong and Lillie[3] called attention to a virus which they had recovered from monkeys and with which they were not familiar. They encountered this virus in the course of transmission experiments in monkeys previously injected with autopsy material from a case of encephalitis. They were uncertain whether the infection originated independently in monkeys or was inoculated with material from human cases. These authors injected mice with small dilutions of various tissues of the infected monkeys and showed that the virus is harbored in large amounts in all the organs and tissues tested. Guinea pigs and white rats were also susceptible to infection by this virus.

Traub,[17] in 1935, recovered a virus from white mice which closely resembled that of Armstrong. Traub isolated this virus while working with equine encephalomyelitis. At first, its origin was doubtful. The author then took sixty healthy mice and inoculated each intracerebrally with sterile bouillon. Ten mice showed symptoms and pathologic findings characteristic of lymphocytic meningitis in mice. This seemed to show that the infectious agent was carried by apparently healthy mice. The incubation period in mice was five to ten days. Guinea pigs were very susceptible to the virus following intracerebral, subcutaneous and intranasal injection.

Rivers and Scott,[13] in 1935, reported the isolation of a virus from two men who developed an illness characterized by the syndrome described as lymphocytic meningitis. Both patients made an uneventful recovery. The spinal fluid of each patient was inoculated intranasally, intraperitoneally, and intracerebrally into six mice. The mice became sick after one week. The authors then inoculated bacterially sterile brain material of these mice intracerebrally into other mice and succeeded in passing the virus serially through ten lots of mice. It was discovered from various neutralization experiments that the Armstrong, Rivers, and Traub viruses were immunologically identical.

In the human cases, Rivers found this virus in the spinal fluid only during the first ten days of the illness, while the neutralizing antibodies appeared in the blood after about six weeks. Armstrong and Wooley[4] have reported a case of aseptic meningitis from which they obtained neutralizing antibodies from the blood serum as long as four years and seven months following recovery. It appears, therefore, that in at least some cases of so-called lymphocytic meningitis, a specific virus has been isolated. Armstrong and Dickens suggest that in these cases the disease be now called lymphocytic choriomeningitis, since they were able to grow this virus in the chorioallantoic membrane of the chick embryo.

It is well to emphasize that this isolated virus is the cause of only a few cases presenting the clinical picture of lymphocytic meningitis. Baird and Rivers failed to find activation in the spinal fluid of forty-one patients suffering from this illness. They were also unable to isolate neutralizing antibodies from the sera collected from twenty-one patients who had recovered. Armstrong and Wooley had similar experiences. Of fifty-eight cases diagnosed as lymphocytic meningitis, they were able to demonstrate antibodies in only 32 per cent. It appears that the clinical entity of lymphocytic meningitis probably is caused by more than one etiologic agent. It seems preferable, therefore, to refer to the condition under the general heading of lymphocytic meningitis, and to further classify the cases etiologically as other causative agents are discovered.

There are no specific therapeutic measures. However, the general supportive procedures are of value until the patient is over the acute phase of the illness.

At the University of Minnesota Hospitals ten cases of lymphocytic meningitis have been observed within the past ten years. In one of these (Case 1), antibodies against the virus of lymphocytic choriomeningitis were demonstrated in the blood serum. In three of the other cases the neutralization tests were done on the sera five months, one year and two years, respectively, following recovery, with negative results.

Case 1.—S. L., a forty-nine-year-old Norwegian man, by occupation a farmer, was first admitted to the hospital on July 26, 1937, because of a constant frontal headache which had been present for two weeks, during which time it had increased in severity. This was accompanied by a feeling of general malaise. Two days prior to admission, stiffness of the neck appeared. He had had no premonitory symptoms. His previous health had been good. There was no family history of infection or illness.

On admission the temperature (by mouth) was 102° F., the pulse rate was 80 and the respiratory rate 20. The patient was nervous, apprehensive, and complained of severe frontal headache. Moderate rigidity of the neck and back was present and Romberg's sign was positive. The Achilles reflexes were absent and the other deep tendon reflexes were diminished though equal. The rest of the neurologic examination revealed nothing of consequence. The general physical examination was entirely negative. Skin tests with old tuberculin in a concentration of 1:100 gave negative results. X-ray examinations of his chest, skull and sinuses were also essentially negative.

Cerebrospinal fluid, obtained by lumbar puncture, was examined on a number of occasions during the course of his hospitalization. The cell count per cu. mm. varied from 40 to 1,500 with a great predominance of lymphocytes. The spinal fluid protein was elevated, the highest value being 217 mg. per 100 c.c. There was a reduction in the spinal fluid sugar, the lowest value being 23 mg. per 100 c.c. The bacteriologic studies on the spinal fluid were extensive and included, in addition to the routine smears and cultures, a search for the higher fungi as well as the inoculation of guinea pigs. All of these examinations were negative. Blood smears showed 65 to 78 per cent neutrophiles and 16 to 30 per cent lymphocytes. The hemoglobin concentration was normal. The sedimentation velocity of the red blood cells was normal. Blood cultures were repeatedly sterile. The complement fixation and flocculation tests of the blood for syphilis were negative. Agglutination tests of the blood for typhoid, paratyphoid, melitensis, tularemia, and dysentery were negative, as was also the Weil-Felix reaction. Blood drawn approximately one month after the patient entered the hospital was sent to Dr. Charles Armstrong of the National Institute of Health, and he reported that the serum contained a strong concentration of antibodies against the virus of lymphocytic choriomeningitis.

The original diagnostic impression was that of a meningitis or an encephalitis of an undetermined type. As a precautionary measure, sulfanilamide was given parenterally daily during one week of his hospital stay, and during this period the patient's headache and cervical rigidity seemed to become less pronounced. The temperature during the first few days in the hospital was somewhat septic, reaching 104° F. on one occasion. He continued to complain of a constant frontal headache, which varied in intensity but was usually quite severe. The ordinary anodynes gave little relief and codeine was necessary to control his discomfort. Stiffness of his neck disappeared shortly after admission. Although weak, he was up and about part of the time. He was dismissed as improved after three and one-half months of hospitalization with a diagnosis of lymphocytic choriomeningitis.

He was seen again eight months later, at which time he reported that he had continued to have headache, generalized weakness and nervousness. In addition he complained of a mild equilibratory disturbance, tinnitus on the left, occasional epigastric distress and constipation. He appeared ill disposed and was particularly distressed by the headache. His general physical condition was unchanged except that he was somewhat more gaunt than formerly. The neurologic abnormalities at this time were a positive Romberg, slight horizontal nystagmus on lateral deviation of the eyes, stiffness of the back, absent abdominal reflexes, diminished patellar reflex on the left, absent Achilles reflexes and slight impairment of superficial sensibility over the entire left lower extremity. Laboratory studies, with the exception of the cerebrospinal fluid findings, were entirely negative. The spinal fluid contained 144 cells per cu. mm., of which 81 per cent were lymphocytes; the protein was 174 mg. per 100 c.c.; the sugar was below 8 mg. per 100 c.c. Blood was again sent to the National Institute of Health, and Dr. Jerald G. Wooley reported that there was still a strong concentration of lymphocytic choriomeningitis virus antibodies present.

Case 2.†—L. W., a three-year-old child who entered the hospital on September 14, 1938, was well until eleven days previously, when he stepped on a nail, receiving a foot wound. Treatment of this injury was limited to cleansing with turpentine and bandaging. Five days later he developed a headache, anorexia and constipation. Headaches and malaise continued but the patient was not completely confined to bed. During the next few days his temperature became elevated, and he developed some vomiting and stiffness of the back. On the day of admission rigidity of the neck appeared. His past history disclosed nothing of significance. The family history was non-contributory.

On admission to the hospital his temperature was 102.4° F. (by rectum), the pulse rate 130, and the respiratory rate 22. He appeared ill, was hyperesthetic and irritable. Except for some pharyngeal injection the general physical examination was negative. The neurologic examination revealed a moderate stiffness of the neck and back, some muscular rigidity involving the extremities, slight muscle tenderness in the lower limbs, questionably positive Kernig's sign and exaggerated tendon reflexes.

Urinalysis was negative. The hemoglobin was 89 per cent; the leukocyte count was 13,300 with 61 per cent neutrophiles and 39 per cent lymphocytes. The serologic tests for syphilis were negative. Lumbar puncture the day of admission revealed clear cerebrospinal fluid under a pressure of 18 mm. of mercury, but the patient was not well relaxed at the time of this reading. There were 146 cells per cu. mm.—all mononuclears. The Nonne test was positive. The sugar was 76 mg. per 100 c.c. of fluid. The colloidal gold reaction was negative. Eight days later the cell count had decreased to 8 per cu. mm. (6 mononuclears and 2 neutrophiles), the protein was 43.6 mg. per 100 c.c. and the sugar 82 mg. per 100 c.c. The bacteriologic examinations, which were done on both specimens of fluid removed, were negative. For technical reasons serum obtained from this case could not be tested for neutralizing antibodies.

Improvement was noted the day following admission; the neck was less rigid and there were no signs of spasticity of the extremities. The temperature rose to above 100° F. rectally during each of the three days following admission, but thereafter was normal. By the fourth hospital day the patient was symptom-free. He received no treatment other than general supportive measures and was discharged from the hospital nine days after admission.

Case 3.†—J. P., a seven-year-old white boy, became ill three days prior to admission to the hospital on August 29, 1938, when he suddenly developed a frontal headache accompanied by vomiting. The following day his temperature had risen to 103° F., and a diagnosis of influenza was made. He developed anorexia, constipation and photophobia. There was some improvement for part of the next day, and he felt well enough to be up, but in the evening he again felt ill and returned to bed. On the morning of the day he went to the hospital his temperature was 105° F., he was drowsy and his neck was stiff. The anamnesis disclosed that an illness called influenza was prevailing in his community at the time, but there was no definite history of exposure to the infection. His previous health had been good.

On admission his temperature was 101.8° F., the pulse rate 94, and the respirations 18. He was rather drowsy, looked feverish and was quite obviously ill. His throat was red but the general physical examination was otherwise negative. The significant neurologic findings were slight retraction of the head, cervical rigidity, questionable Kernig's sign, suppression of the tendon reflexes, absent abdominal reflexes, a positive Babinski on the right and a questionably positive response to plantar stimulation on the left.

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†These cases are presented through the courtesy of Dr. Irvine McQuarrie, Professor and Head of the Department of Pediatrics.

The laboratory studies revealed a negative urinalysis. The leukocyte count was 22,700 with 84 per cent polymorphonuclears. The red blood cell sedimentation rate was rapid. A blood culture was sterile. The serologic tests for syphilis were negative. Non-hemolytic streptococci and staphylococci were found on nose and throat cultures. There was no reaction to old tuberculin 1:1000 and an x-ray of the chest was negative. The cerebrospinal fluid obtained on lumbar puncture contained 110 cells per cu. mm., of which 93 per cent were mononuclears; there were 73 mg. of protein, 63 mg. of sugar, and 730 mg. of chlorides in each 100 c.c. of the fluid; the bacteriologic studies, which included direct examination and culture, were negative. Two days later the cell count was 82 per cu. mm. (3 neutrophiles and 79 mononuclears); the protein was 108 mg., the sugar 84 mg., and the chlorides 710 mg. per 100 c.c. of spinal fluid. At a still later date there were 35 cells per cu. mm. (3 neutrophiles and 32 mononuclears). The spinal fluid remained sterile. Neutralization tests on the serum for antibodies against the virus of lymphocytic choriomeningitis could not be done because the sample of blood was inadvertently contaminated.

The patient received sulfanilamide during the first five days of his hospital stay. He was also given intravenous fluids. The temperature remained elevated for a week, the highest reading being 105° F. The patient was restless, irrational and took food poorly. Two days after admission the neck rigidity disappeared, and the only reflex abnormality was a positive Babinski on the left side. Improvement was gradual, although listlessness continued for some time. He was discharged after a hospital stay of twenty-one days. No record was made of his neurologic status at the time of discharge, but this was entirely normal upon examination one month later.

Case 4.—V. A., a white man eighteen years of age, felt well until seventeen days prior to his hospital admission, when he injured his neck in a wrestling match. Subsequently he developed pain and stiffness in his neck, especially on motion. During the next few days a severe frontal headache appeared accompanied by anorexia, nausea, vomiting, and constipation. He felt as though he had a fever part of the time. His symptoms had begun to improve prior to his admission to the hospital on June 11, 1932. The past history revealed nothing unusual.

The general physical examination was negative. The neurologic abnormalities consisted of some hyperemia of the optic discs with blurring of the margins, stiff neck and positive Kernig's sign. The temperature and pulse were normal.

The urinalysis was negative, as were also the blood studies. A radiograph of the cervical spine was negative. Lumbar puncture was first performed on the day following admission, which was eighteen days after the onset of his illness. A cloudy fluid was obtained, which contained 750 cells per cu. mm., mostly lymphocytes. The Nonne and Noguchi tests were positive; the colloidal gold reaction was negative; bacteriologic studies, including guinea pig inoculation, failed to demonstrate the presence of any microörganisms. The next day the spinal fluid was clear, but contained 150 cells per cu. mm., of which approximately 95 per cent were lymphocytes. No bacteria were found on stained smears. The blood and spinal fluid serologic tests were negative for syphilis.

The patient was given antimeningococcic serum following the first lumbar puncture. His symptoms gradually subsided, and in one week he felt entirely well. He refused to undergo any further treatment and left the hospital at the end of the second week.

Case 5.—M. H., a twenty-three-year-old white woman who came to the hospital on July 4, 1929, was well until ten days before. At that time she developed a headache, slight fever and a sense of stiffness in her right extremities lasting for several days. One week later her headache recurred and her temperature rose to 101° F. Subsequently she experienced anorexia, nausea and vomiting, and later stiffness of her neck. Her past health had been fairly good. The only point of interest in her family history was that a sister had tuberculosis, but the patient's recent contacts with her were only casual.

On admission the patient's temperature was 101.6° F., the pulse rate 80, and the blood pressure 114 systolic and 80 diastolic. She appeared very ill and complained of severe headache. The general physical examination disclosed no remarkable abnormalities. The only significant neurologic finding was cervical rigidity. Kernig's sign was negative.

The urinalysis was negative except for numerous leukocytes. The blood count showed a normal red cell count, but the white cells were 17,200 with 90 per cent polymorphonuclears and 10 per cent lymphocytes. Serologic tests of the blood and spinal fluid for syphilis were negative. Opalescent cerebrospinal fluid was obtained on lumbar puncture under pressure of 170 mm. of water; this contained 850 cells per cu. mm., of which 80 per cent were small lymphocytes, 8 per cent large mononuclears, and 12 per cent polymorphonuclears. The Nonne and Noguchi tests were positive, as was a qualitative determination of the sugar; no bacteria were demonstrated. On the following day the cerebrospinal fluid was still opalescent, and the cell count was 350 per cu. mm., with a preponderance of lymphocytes. Her blood leukocyte count decreased to 10,700. Several days later her spinal fluid pressure was 20 mm. of water; the fluid was almost clear, but still contained 135 cells per cu. mm. The Nonne and Noguchi tests were now negative. The spinal fluid was inoculated into a guinea pig, and was reported later to show no evidence of tuberculosis. Thereafter the spinal fluid findings gradually returned to normal, and two weeks after entrance to the hospital the cell count had decreased to four per cu. mm.

Within a few days after her admission the patient was feeling much better and her temperature was normal. The neck rigidity disappeared by the fifth hospital day. For ten days prior to her dismissal she was entirely free of signs and symptoms of her illness. No treatment was given except for ordinary supportive measures.

Case 6.—L. W., a forty-five year old married woman, two weeks prior to her entrance to the hospital on November 28, 1936, suddenly developed headaches, nausea, and vomiting. The following day her neck was stiff, and she had an elevated temperature. Her local physician performed several lumbar punctures with some relief of the symptoms. The spinal fluid was said to have been cloudy, but no organisms were found in it. Serum was given but the type was not reported to us. During the week immediately preceding her admission to the hospital, she noticed blurring of vision, difficulty in swallowing, photophobia, and backache; her headaches, however, became less pronounced. She had previously been in fairly good health, although several years before she had suffered from some motor disturbance, the nature of which was not definitely diagnosed. There was no history of any other recent ailment nor of definite exposure to an infectious illness.

On admission to the hospital she complained of frontal and occipital headache but did not appear acutely ill. Her temperature, pulse, and respirations were normal. The blood pressure was 164 systolic and 106 diastolic. Photophobia existed and a slight vertical nystagmus was elicited. The rest of the cranial nerves were negative. The tendon reflexes were generally exaggerated, there was unsustained clonus at both ankles, and the Babinski's sign was questionably positive bilaterally. The rest of the neurologic examination was normal, as was the examination of the other body systems. A Mantoux test was negative.

Urinalysis did not reveal any abnormality. The hemoglobin was 72 per cent and the leukocyte count 6,000 with a normal differential. The sedimentation velocity of the red blood cells was markedly accentuated. The complement fixation and flocculation tests of the blood for syphilis were negative. The fasting blood sugar was 152 mg. per 100 c.c. On the day of admission lumbar puncture was done and clear fluid was obtained under no increase in pressure; this fluid contained 31 cells per cu. mm., 86 per cent being mononuclears. Smears and culture of the fluid failed to reveal organisms, and guinea pig inoculation for tuberculosis was negative. Roentgenographic studies of the skull and chest were negative.

The patient's discomfort abated quite promptly, and within a week after entrance to the hospital she felt well. The abnormal physical findings also disappeared. At no time did she have a fever. The blood pressure fell to 110 systolic and 74 diastolic. Her cerebrospinal fluid was reëxamined approximately one and two weeks after admission, showing on these occasions 28 and 33 cells per cu. mm. respectively, all mononuclears. The spinal fluid protein and sugar values were normal; the colloidal gold reaction and the tests for syphilis were negative. No organisms were ever demonstrated in the spinal fluid. Two and one-half weeks after admssion she was released from the hospital. One year later she seemed to be entirely well, and at this time her serum was examined by Dr. Wooley of the National Institute of Health for antibodies capable of neutralizing the virus of lymphocytic choriomeningitis, with negative results.

Case 7.—G. P., a twenty-year-old woman, was well until the day before admission to the hospital on September 23, 1935. At that time she suddenly developed a severe generalized headache, which increased in intensity and was associated with projectile vomiting and stiffness of the neck. She had had no recent exposure to any infectious illness. Her previous health had been good. There was no history of a tuberculous infection nor any earlier nervous ailment. Tuberculosis had caused the death of a sister seven years before, and of her mother three years before. The family history was otherwise essentially negative.

Examination revealed a well developed, well nourished patient, who complained bitterly of headache. Her mouth temperature was 102° F.; the pulse and respirations were normal. Neck rigidity was present and Kernig's reaction was positive. The examination by body systems otherwise gave negative results.

Laboratory studies showed the hemoglobin to be 95 per cent, and the leukocyte count was 9,600 with a normal differential. Urinalysis was negative. The complement fixation and flocculation tests of the blood for syphilis were negative. Cerebrospinal fluid obtained by lumbar puncture the day of admission contained 575 cells per cu. mm., of which 96 per cent were mononuclears. The smears of this fluid were negative, and no organisms were found on culture. A radiograph of her chest disclosed calcified mediastinal glands on the right; films of the skull showed no abnormalities.

It was assumed that she had a meningitis; and because of the possibility that it might be meningococcic, specific antitoxin was administered intrathecally the day of admission and on the following day. Subsequent to this therapy the pleocytosis rose to 4,600 cells per cu. mm., and for several days the differential count showed 85 to 90 per cent neutrophiles. On the fifth hospital day the cell count decreased to 175 per cu. mm., all of which were mononuclears. The sugar and chlorides were repeatedly normal, while the protein content was moderately elevated. No microörganisms were demonstrated in any specimen of cerebrospinal fluid. Guinea pig inoculations were negative for tuberculosis. Clinically she seemed to lose ground during the first few hospital days. She became stuporous, developed bilateral papilledema of about one diopter, and presented greatly exaggerated patellar reflexes. These findings disappeared rapidly, and in less than a week following her admission she was entirely asymptomatic. Her temperature never rose above 103° F.

(oral). After the fourth hospital day it remained below 100° F. Two weeks after her admission the spinal fluid contained 30 cells per cu. mm., 70 per cent of which were mononuclears; the bacteriologic studies remained negative. The tests of the spinal fluid for syphilis were negative, as was the colloidal gold reaction. She was dismissed from the hospital after a stay of three and one-half weeks, feeling entirely well.

Case 8.—H. R., a twenty-three-year old man, became ill thirty-six hours prior to his admission to the hospital on August 14, 1935. He developed a headache and had some soreness of the throat. Later he noticed malaise, weakness of the legs, dysuria, abdominal distress, and vomiting. The past history revealed nothing of a contributory nature. There was no recent exposure to any infectious disease.

Examination showed a well developed, well nourished individual who appeared restless and uncomfortable. His temperature (oral) was 100.4° F., and the pulse rate was slightly elevated. The only positive findings on physical examination were slight injection of the throat, a minimal amount of neck rigidity, and generalized suppression of the tendon reflexes.

Laboratory studies revealed a negative urinalysis, normal hemoglobin and a blood leukocyte count of 8,800 with a normal differential. The complement fixation and flocculation tests of the blood for syphilis were negative. The agglutination tests for typhoid, paratyphoid, undulant fever, tularemia, and dysentery gave negative results. On lumbar puncture the day after admission, clear cerebrospinal fluid was obtained under 18 mm. of mercury pressure; this contained 30 cells per cu. mm., all mononuclears. The protein content was 38 mg. per 100 c.c., the sugar 84 mg. per 100 c.c., the chlorides, 716 mg. per 100 c.c. Both the colloidal gold reaction and the spinal fluid serologic tests gave negative results.

On the second hospital day he felt much improved, and his temperature and pulse were normal. He received no treatment other than bed rest. He was entirely free of symptoms for several days prior to dismissal on the sixth day after his admission. Two years later he was still well, and at this time his blood serum was examined at the National Institute of Health for antibodies against the virus of lymphocytic choriomeningitis, but the results were negative.

Case 9.—E. S., a twenty-two-year-old University student, awoke with a severe frontal headache and backache two days before coming to the hospital on May 2, 1937. She had general malaise, and after being up for a few hours returned to bed, remaining there until entrance to the hospital. Prior to the time of admission she had developed stiffness of the neck and some dizziness. There were no other symptoms, either premonitory to or accompanying this illness. However, a year previously she had been found to have a positive Mantoux test and roentgenologic evidence of incipient tuberculosis of both upper lobes, the degree of activity being questionable. This disorder was asymptomatic, and no specific treatment was given. Her physical condition otherwise had been good. There was no history of recent contact with an infectious disease. The family history revealed nothing of import.

On examination the only definite positive findings were stiffness of the neck and a positive Kernig's sign. There was an equivocal hyperemia of the right optic disc. The rest of the neurologic signs were normal, as was the general physical examination.

Laboratory studies revealed a negative urinalysis. The white blood count was 10,000 with 70 per cent neutrophiles. The hemoglobin was 80 per cent. On lumbar puncture, clear cerebrospinal fluid was obtained under normal pressure. No pellicle formed. The cell count was 83 per cu. mm., but the types of cells were not differentiated; the sugar was 75 mg. per 100 c.c., the protein 62 mg. per 100 c.c., and the colloidal gold reaction showed a midzone curve. This fluid was sterile bacteriologically. The tests for syphilis were negative on both the blood and spinal fluid. A radiograph of her chest showed the tuberculous condition to be unchanged from the year before.

Her headache was slightly improved on the day following admission. On the second day of her hospital residence the Kernig's reaction became negative, and by the fourth day there were no positive physical findings. The temperature readings were normal. Cerebrospinal fluid obtained three days after admission contained 250 cells per cu. mm., of which 98 per cent were mononuclears and 2 per cent neutrophiles; the protein content was slightly high; the sugar and chlorides were normal; smears and culture were negative; guinea pig inoculations disclosed no evidence of tuberculosis. On the sixth day there were still 290 cells per cu. mm., all being mononuclears, but at the end of two weeks this number had fallen to 47 cells per cu. mm., 98 per cent of which were mononuclears. The routine bacteriologic studies continued to be negative. Treatment consisted only of general supportive measures. She was symptom-free after the fourth day, and remained so until after the final lumbar puncture, when the headache and backache recurred. She asked to leave the hospital on the seventeenth day, and was dismissed, but returned two days later because of persisting headache. At this time there were no signs of meningeal irritation. The headache disappeared rather promptly after a short period of bed rest. During the course of the following year and a half she was seen several times, and had no further difficulty. Blood drawn five months after the onset of this illness was found at the National Institute of Health to contain no antibodies against the virus of lymphocytic choriomeningitis.

Case 10.†—H. C., a nineteen-month-old child, was brought to the hospital on November 2, 1938, with symptoms dating back four weeks. At that time he had injured his head in a fall. He soon became restless and irritable, vomited, lost weight, had stiffness of the neck and an elevated temperature. These symptoms varied in some degree but persisted until admission to the hospital. The physician who cared for him had diagnosed meningitis. For about two weeks before he was hospitalized he complained of bilateral earache, but there was no otorrhea. During this period it was noticed that there was impairment of hearing. He appeared to have some gait difficulty. His birth and early development were normal. His past health was good except for impetigo five months previously and a draining left ear three months before. No exposure to any infectious disease was reported. The family history was essentially negative.

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†This case is presented through the courtesy of Dr. Irvine McQuarrie, Professor and Head of the Department of Pediatrics.

When the patient was admitted, his temperature, pulse, and respirations were normal. There was a mucopurulent discharge in both nostrils. The cochleopalpebral response could not be elicited, suggesting an absence of useful hearing. The eardrums were normal, as was the throat. The neck was stiff. Brudzinski's sign was questionably positive. Kernig's reaction was negative. Except for moderate emaciation, the examination of body systems showed nothing noteworthy.

The urinalysis was negative. The white blood count was 5,900 with 56 per cent lymphocytes. The hemoglobin was 62 per cent. Cerebrospinal fluid obtained on lumbar puncture contained 1,100 cells per cu. mm., with 73 per cent being lymphocytes; the protein was 149 mg. per 100 c.c., and the chlorides 664 mg. per 100 c.c. The spinal fluid was sterile on culture, and no bacteria were seen on direct examination. The serologic studies of the blood and spinal fluid were negative. Agglutination tests of the blood were negative for typhoid, paratyphoid, melitensis, tularemia, dysentery (Shiga), but positive in a dilution of 1:320 for dysentery (Flexner) on one occasion. The latter finding was of indefinite significance in view of the fact that there was no other clinical evidence of dysentery. Radiographs of the skull, mastoids, paranasal sinuses and long bones revealed nothing significant.

On the second day of his hospital residence his temperature rose to 103° F., and there were occasional elevations to above 101° F. for a period of two weeks, but most of this time he had no fever. For several days he was restless and fretful, showing no desire to eat. The signs of meningeal irritation disappeared in about a week. The nasal discharge persisted longer and the hearing defect did not improve. Therapy was limited to the ordinary supportive measures. Ten days after admission the spinal fluid contained 169 cells per cu. mm., 97 per cent of which were mononuclears. The protein value was high and the sugar was low in these specimens. Two weeks after entrance there were 68 cells per cu. mm. in the spinal fluid, 94 per cent being mononuclears. During the third week the pleocytosis had decreased to 23 white cells and all of these were mononuclears; the protein had become normal. The sugar continued to be slightly low, while the chlorides remained normal. No microörganisms were found in the smears or on the culture of the spinal fluid. The blood leukocyte count stayed within normal limits. The patient appeared quite well at the time of his dismissal three and one-half weeks following admission, and was neurologically negative.

Summary

1. Lymphocytic meningitis is presented as a clinical syndrome characterized by symptoms of meningeal irritation and lymphocytosis in the spinal fluid. The duration is usually brief (several days or a few weeks); complications are typically absent.

2. Ten cases of the condition are reported.

3. The blood serum of one case contained neutralizing antibodies against the virus of lymphocytic choriomeningitis. This case is of special interest in that it has run an active course for a year. It cannot be considered "benign."

4. The term *lymphocytic meningitis* is therefore suggested as a replacement for the term *benign lymphocytic meningitis* which is in common usage.

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HISTORY OF MEDICINE IN RAMSEY COUNTY

BY J. M. ARMSTRONG, M.D.

(Continued from June issue)

BIOGRAPHIES

The following short biographies of deceased physicians of Saint Paul supplements the information in the text of the History of Medicine in Ramsey County. The writer may be criticized for including notices of obscure and irregular practitioners, but an endeavor has been made to make the history as complete as possible to the year 1870.

Rudolph Alberti

Dr. Rudolph Alberti came to Saint Paul in 1855. Previous to that time he had been in Memphis as Emil Geist knew him there before he came to Saint Paul. According to Frank Werner he was a Pole and came from Krotichin near Posen. He claimed to have been a graduate of the University of Berlin. He was somewhat of a mystery even to the Germans in Saint Paul, and they could not quite fathom his domestic relations. He left Saint Paul and on his return had a woman with him and a child older than the number of years that had elapsed during his absence. He said the child was his. At one time he was in Dubuque and also in Winona and Chicago. He is described as being a heavy set man with dark hair which he wore rather long and pomaded with macassar oil. Dr. Wharton said he was a man of some ability, but rather shunned contact with the American physicians and was looked on with suspicion as to his qualifications. Nothing further seems to be known about him.

William Baldwin

Dr. William Baldwin came to Saint Paul in 1868, not with the idea of building up a practice but to better his enfeebled health. He was born at Washington, Mason County, Kentucky, March 4, 1813. He attended Ohio University at Athens, Ohio, and received his medical education under a preceptor, though he attended one course of lectures at the University of Pennsylvania, and possibly received his degree there in 1838. In 1854 he received an honorary degree of Doctor of Medicine from the Ohio Medical College at Cincinnati. He began the practice of medicine at Centreville, Alabama, in 1837 and in 1840 moved to Platte City, Missouri, where he became the president of the first medical society to be established in that county. He evidently was a man of some ability in his day. He died in Saint Paul, January 19, 1886. He was one of the founders of the Ramsey County Medical Society.

William Banks

Dr. William Banks came to Saint Paul in 1868. He is the only one of the original members of the Ramsey County Medical Society whose history we have been unable to trace, nor do we know how long he remained in Saint Paul. He must have been a graduate in medicine or he would not have been admitted to the Society. We do find, however, that a William Banks graduated from Jefferson Medical College in 1848, but we can only conjecture that he was our William Banks.

Percival Barton

Dr. Percival Barton was born at Anson, Maine, November 16, 1822, and died on his farm at Inver Grove, Dakota County, Minnesota, February 21, 1914. In 1846 he read medicine with Dr. M. C. Richardson of Hallowell, Maine, and in the same year attended Dartmouth Medical School, and then had Dr. Isaac Palmer of Anson, Maine, as his preceptor. He returned to Dartmouth where he became assistant to the Professor of Anatomy, and for a short time practiced with Dr. John Hubbard. He then attended the Medical Department of the University of Pennsylvania, where he graduated in April, 1849.

Doctor Barton practiced medicine in New Portland, Kingfield and Vasselboro, Maine, till he came to Saint Paul in 1854 where he remained but a few weeks before going to Inver Grove. He was Assistant Surgeon, Seventh Minnesota Volunteer Infantry, and on April 20, 1865 was put in charge of the Freedmen's Hospital at Selma, Alabama. After his discharge from the Army he returned to Inver Grove. For several years prior to his death he was the oldest living graduate of the Medical Department of the University of Pennsylvania.

Medically he was a generation or two behind the times, being an anti-vaccinationist and anti-everything modern in medicine. In 1898 he published a small book of sixty-nine pages, "Common Sense for Common People versus Microbes and Official Tyranny." It was directed largely against the State Board of Health. Mr. J. C. Bryant, at that time principal of the High School, had the temerity to write a commendatory preface to it. Since Barton was the only physician residing in Inver Grove, the Town Board made him Health Officer there. This position enabled him to cause no end of trouble to the State Board of Health. He lived to be over ninety years of age.

Charles Hodge Boardman

Dr. Charles H. Boardman came to Saint Paul in 1868. He was a graduate of Yale College in 1859 and received his medical degree at the University of Pennsylvania in 1862. With the exception of the time spent in the Army as Assistant Surgeon, he practiced medicine in Philadelphia previous to his coming to Saint Paul. At one time he was surgeon to the Northern Pacific Railway Company, and lectured on medical jurisprudence at the University of Minnesota from 1887 to 1890. He was president of the Ramsey County Medical Society in 1876 and recording secretary of the Minnesota State Medical Society in 1877.

Doctor Boardman was well versed in the classics and his knowledge of the medicine of antiquity was profound. His graduating thesis at the University of Pennsylvania "De Novo Anæsthetico" was probably one of the last in Latin. He was born May 25, 1838, and died in Brooklyn, New York, July 17, 1907. He left Saint Paul about 1890. He was one of the original members of the Ramsey County Medical Society.

E. E. Braun

Dr. E. E. Braun, a French-Canadian, came to Saint Paul from Charlestown, Massachusetts, in 1859. In 1861 he took service in the Army and was Post

Surgeon at Forts Abercrombie, Wadsworth, Ridgely, and Ripley. He was born at Quebec, June 11, 1821, and educated at Nicollet College, Three Rivers, Canada. In 1868 he settled at Little Falls, Minnesota, where he died October 14, 1870.

In the year 1866 Doctor Braun discovered a small tumor on the inner side of his right thigh, equidistant between the hip and knee. This tumer progressively enlarged and in November, 1869, caused him to be confined to his bed. Ulceration occurred in July, 1870. At the time of his death shortly after this date, the tumor weighed fifty-seven pounds. The State Medical Society appointed a committee to determine the nature of this tumor. It was examined by Dr. Harry C. Hand who reported it to be a colloid spindle-celled sarcoma.

Albert G. Brisbine

A native of New Lisbon (now Lisbon), Ohio, Dr. Albert G. Brisbine was born in 1825. He was a graduate of Jefferson Medical College and came to Saint Paul in 1851. He was present when the writer was born and cared for him during his childhood. I remember when he came to see me when I sustained a Colles fracture and watching him as he whittled out a splint from a shingle, being somewhat in doubt as to where the shingle was to be applied. He was regarded by his later contemporaries as somewhat out of date. He lived for many years on Pleasant Avenue, where the Peoples Church now stands, in a house well set back from the street with many rose bushes in the yard. Our family set great store by a cough medicine of his, later known to the druggists here as Canada Balsam Compound, which tasted very much worse than it sounds. Long after his death that prescription was filled many times at Carl Simon's Drug Store on Third and Market Streets.

Dr. Brisbine was one of the founders of the Minnesota State and Ramsey County Societies. His office for many years was on the river side of Third Street just east of Washington Street. When the late Dr. E. J. Abbott came to Saint Paul, he went into Doctor Brisbine's office, and Dr. Clinton C. Miller was also at one time associated with him.

Dr. Brisbine died as the result of an accident on June 3, 1887. He stooped to pick a flower from the edge of the bluff, along the present River Boulevard, lost his balance and fell over, rupturing his liver, and died a few days later. He was a very large man and must have weighed nearly three hundred pounds.

David Day

Dr. David Day was born in Burkes Garden, Virginia, on September 19, 1825. He came west to Wisconsin and engaged in lead mining, studying medicine evenings and in his leisure hours, and attended the University of Pennsylvania in the winters when he could. He came to Saint Paul in 1849 on the advice of his brother, Dr. J. H. Day, then practicing in Stillwater. On his way to Saint Paul he contracted the measles and was obliged to stop over at Prairie du Chien on that account. He nearly died of the disease and tuberculosis set in. Finally, when he arrived in Saint Paul in May, one lung was completely hepatized and he was so weak he had to be carried up the hill from the landing. Shortly after his arrival, Minnesota Territory and Ramsey County were organized, and Governor Ramsey appointed him Register of Deeds for the county. In 1850 he was elected to that office for the succeeding two years.

In 1852 because of his health Doctor Day wished to be out in the pine woods, so Governor Ramsey secured for him the position of physician to the

Winnebago Indians, then at Long Prairie, where he remained till the spring of 1854, putting in a very profitable two years studying and with great improvement of his health. He also put aside sufficient money to start himself in the drug business on his return to Saint Paul. While at Long Prairie he was elected to the Legislature of 1852 and 1853. This last year he was elected Speaker of the House by one vote on the sixty-fifth ballot after twenty-two days of voting. After his return to Saint Paul he gradually gave up practice and turned his entire attention to the drug business (Day and Jenks) both wholesale and retail. His place of business was on Third and Cedar Streets. He retired from business in 1866. He was State Prison Inspector in 1871, Wheat Commissioner in 1874, and Postmaster of Saint Paul from 1875 to 1888.

Doctor Day was a large man and wore a full beard and mustache, both of which were white as the writer remembers him. He was among the first to advocate a medical practice act and at the first meeting of the present State Medical Association (February 1, 1869) introduced a resolution that a committee be appointed to confer with the Legislature on the subject. He was one of the founders of the Ramsey County Society. He died in Saint Paul, March 8, 1896.

John Harvey Day

Dr. John Harvey Day was born in Virginia, April 20, 1816. He came to Minnesota, or Wisconsin Territory as it then was, in 1847 about two years before his brother, Dr. David Day; it was on Dr. J. H. Day's suggestion that David came to Saint Paul. He first settled in Stillwater having practiced at Prairie du Chien before that time. He, with Doctor Carli of Stillwater, were the two physicians out of the sixty-one signers of the memorial addressed to President Pierce asking for the organization of the Territory. He was known to the early settlers as the "old doctor" in distinction to David Day who was the "young doctor." In 1854 he was elected from Saint Paul to the Fifth Territorial Legislature. He left Saint Paul the same year and went to Leavenworth, Kansas. After remaining there some time he went to Walla Walla, Washington, where he died in 1897. He and Dr. David Day looked very much alike and dressed alike; they were both large handsome men. Dr. J. H., however, had blue eyes while Dr. David had brown eyes. He was ten years David's senior in age.

In the early days in Saint Paul, French was spoken as commonly as English, and as neither of the Days spoke French, Mrs. Fuller (formerly Mrs. Samuel Willey) then a young girl, was often asked to act as interpreter for them. Her only playmates at that time were the French half-breed children of Scott Campbell. Dr. John H. Day's name will not be found in the list of graduates of the University of Pennsylvania because apparently he changed his first name from Jeremiah to John. He graduated under the name of Jeremiah H. Day in 1850.

William W. Finch

As stated in the text there was reason to believe that William W. Finch was some place in Minnesota after leaving Saint Paul. The following is abstracted from a History of Steele and Waseca Counties (Chicago 1887):

> "On the 9th of October, 1861, Dr. W. W. Finch was elected county treasurer and served two years. Dr. Finch was originally from Vermont. He came west at an early day and settled in Clinton Falls, where he engaged in farming. He had been a practicing physician

before coming to Steele County, and during his entire residence here he attended calls and took care of a practice which his neighbors forced upon him. He remained in the county for a number of years after the expiration of his term of office as treasurer, and finally removed to Santa Barbara, Cal., where he died. He had accumulated a comfortable fortune before leaving Steele County. Dr. Finch was a man of a good deal of both natural and acquired ability; a man who was esteemed and respected, and justly, by all who knew him."

There is no record that he ever took out a license to practice medicine in California, nor do the records of the California Board of Health extend far enough back to record the date of his death.

Samuel D. Flagg

Dr. Samuel D. Flagg was born in Buffalo, New York, August 7, 1838. He received his medical degree from Jefferson Medical College in 1859, and shortly after graduation obtained an appointment in the Medical Department of the United States Navy. In 1865 he was retired from the Navy for disability because of pulmonary tuberculosis. He came to Saint Paul for his health. It was thought by his friends as well as by himself that recovery was impossible. He arrived about the first of 1866, and almost immediately, owing to his interest in mental diseases, was appointed on the commission to organize the State Insane Hospital.

In 1868 Doctor Flagg brought to Saint Paul and perhaps to Minnesota the first clinical thermometer. Drs. D. W. and H. C. Hand were very much interested in the instrument. Dr. H. C. Hand was familiar with the use of the thermometer.* In 1869 Doctor Flagg performed the first operation for the extraction of cataract in Minnesota. Operations on both eyes of this patient were successful. He told the writer that he was well punished for doing a successful operation, as the old lady at every opportunity thereafter insisted on reading the Bible to him to prove the success of the operation. He never operated for cataract again.

Doctor Flagg was a tall cadaverous looking man, very precise and dignified in his manner, and a great money-maker. He died December 25, 1926, at the age of eighty-eight years. Until five years preceding his death he regularly attended his office and only gave up work when his eyesight failed.

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*See an article published in the *Northwestern Medical and Surgical Journal*, Saint Paul, on temperature following childbirth.

Otis Everette French

Dr. Otis French, son of John French and Mary Richardson French of Boston, was born March 1, 1818. He was educated at Wells Seminary, Jamaica Plains, and at Yale College. He received his medical degree from Harvard in 1841. He practiced medicine in various places: Boston, Philadelphia, Iowa, Minnesota, Illinois, Ohio; Garnett, Kansas; and Denver, Colorado. During the Civil War he was Surgeon of the 114th Regiment, Ohio Volunteers, and was the author of a small manual "The Art of Midwifery." He died in California in 1884.

(To be continued in August issue.)

President's Letter

AMONG the important reports presented to the House of Delegates at the Minneapolis session was a significant account of relations between the practicing profession in Minnesota and the University of Minnesota.

Close contact and a complete understanding of the functions and interdependence of each, are necessary for the successful functioning of the medical school as well as the profession. Our Committee on University Relations, now under the chairmanship of Past President J. M. Hayes of Minneapolis, works closely with Dean H. S. Diehl of Medical Sciences, Dr. Ruth E. Boynton, Director of the Student Health Service, and Mr. Ray Amberg, Superintendent of the University Hospital, toward this end.

Our gratitude is due this group of University officials for their sincere efforts to maintain the University Hospital as a teaching hospital, exclusively, and to avoid, as far as possible, any infringement upon the private practice of medicine. Occasional complaints concerning the coöperation of hospital staff with referring physicians have been carefully and conscientiously heard and every effort has been made to correct the situation.

As a result of efforts by both the University Relations Committee and the Committee on Medical Economics, a new, compulsory senior course on medical ethics, medical organization's and the economic and social relation of the young physician embarking upon practice, has been inaugurated this year. The value of this course as it was outlined in the Medical Economics section of the June MINNESOTA MEDICINE is beyond question. Both students and the officials of organized medicine in the state are deeply indebted to Dean Diehl.

We are indebted, also, to Dr. W. A. O'Brien and the Center for Continuation Study for excellently planned postgraduate courses which bring our members to the University campus in special groups for a week of intensive postgraduate study, following a pattern that is unique in the entire country for this type of study.

Our University Medical School is outstanding among the distinguished medical schools of the country and we are fortunate in Minnesota to have this new opportunity of keeping in close touch with its teaching and research.

GEORGE EARL, M.D., *President,*
Minnesota State Medical Association.

EDITORIAL

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BUSINESS MANAGER
J. R. Bruce

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DR. CHARLES H. MAYO

JUST before our annual meeting the sad news of the death of Dr. Charles H. Mayo on May 26 reached the members. The passing of such a distinguished member of the profession deserves more than the usual mention. If history is a record of the lives of great men, another milestone in medical history has just been passed.

The professional activities as well as the life of Dr. Charlie were always closely linked to those of his older brother, Dr. Will. The two have had a common objective and, what is most unusual, a common purse. As Dr. Charles once said, "My one great ambition is to relieve all the physical suffering possible during my life." The expansion of the Mayo Clinic not only to serve thousands of the sick, but as an educational center, attained this objective in a large way.

To take stock of the life of Dr. Charles H. Mayo is to review the growth of the Mayo Clinic. Dr. Charlie got his start in his medical career when as a boy of twelve he was called upon in an emergency to administer chloroform for his father. He began practice with his father and older brother in the early eighties. The building of the first Saint Mary's Hospital was accomplished in 1883 by the Catholic Sisters after the need of a hospital was demonstrated that year by the visit of a tornado to Rochester. The formation of a group called the Mayo Clinic, the opening of the first clinic building in 1914 and the newer building in 1928 to care for the thousands who visited the medical center each year, all followed in succession. Also should be mentioned the establishment of the Mayo Foundation, in 1915, in affiliation with the University of Minnesota Medical School to incorporate the educational activities of this center, and the establishment, in 1919, of the Mayo Properties Association for the holding of all property, endowments and funds of the Mayo Clinic to insure the permanence of the institution for public service.

Dr. Charlie had more than a spark of genius. Specializing in the early days in surgery of the head and neck, he made use of his mechanical ingenuity in his surgical work at a period when surgeons were more self made than at present. His scientific interests were not limited to the medical field. From an early age he took a great interest in scientific farming, to which his country home, Maywood, attests. His scientific attainments were such that universities honored themselves in bestowing honorary degrees upon him.

Friends and acquaintances found Dr. Charlie a man of many interests and an entertaining speaker. Unostentatious and easily approached, he was also a warm-hearted humanitarian and gave freely of his time and energies to public activities, such as the Minnesota Public Health

Association, the Boy Scout organization and the local health department, which he served without compensation for many years. His was a particularly full life and Minnesota has lost one of its leading citizens.

PURPOSES AND POLICIES OF THE UNIVERSITY HOSPITALS

THE main purpose of the University Hospitals is to train physicians for general practice, to train specialists in their fields and also auxiliary medical assistants so that all of them may in turn serve the communities of the state.

This purpose needs to be re-stated and reemphasized especially to county commissioners and welfare boards throughout the state, in order to protect the standing of the hospital as a teaching institution and to prevent it from being overburdened with relief work.

Along with its teaching, the hospital is indeed able to help solve the problem of the indigent patient. But it should be well understood by county authorities that the University Hospital is not a relief agency. It is only a partial source of hospitalization for the needy of the state and county authorities should make disposition of their patients in their own communities as far as possible using their home facilities and their home doctor and hospital.

The University Hospitals unit is the chief clinical teaching source for the Medical School of the University. In all it has 500 beds including bassinets. Last year the hospital admitted 9,216 in the In-Patient Department, which was an increase of a few from 9,186 admitted the previous year. The total number of hospital days was 132,262 and the average length of stay of patients was 14.1 days. The daily average number of patients was 362 which gave the hospital an average occupancy of 72.4 per cent. The Out-Patient Department visits aggregated 96,082.

The services in the hospital are divided as follows: Neurology, Medicine, Surgery, Ear, Eye, Nose and Throat, Obstetrics, Gynecology, Pediatrics, Psychiatry, and Ambulatory. This distribution is arranged chiefly to satisfy the teaching needs. The administration has attempted to hospitalize a representative group of patients that will be valuable from a teaching standpoint to which the service is incidental. In order to teach by example properly we have attempted to make this a good hospital and one which would be satisfactory to the doctors and agencies who are referring us patients.

At present there are so many on the waiting list, that the average patient's application requires several months before he is admitted for care. All patients are admitted through a central admitting department from which they are selected for teaching purposes and for the emergency treatment sometimes required because of the acuteness of their illness. Patients are admitted on recomendation of their own physician and certification of their county welfare secretary or commissioner. The hospitals conduct its own investigation service and reserves the right to reject any patient not considered financially or otherwise eligible.

Because of teaching and research, we are especially interested in certain types of cases and illnesses. The usual procedure in the selection of cases is to have the senior fellow on the service go over the application list and make the selection for his service. This sometimes works a hardship on the patient, because we are usually loaded with applications for repair of hernias, urological conditions, and chronic surgery such as orthopedics, which we can never hope to take care of. For these cases especially, arrangements should be made with the local physician and hospital.

Ray M. Amberg, *Superintendent*
University Hospitals.

THE DIAGNOSIS OF TUBERCULOSIS

RECENTLY there has been considerable discussion of the comparative place of the various procedures in use, in the diagnosis of tuberculosis.

In a timely and comprehensive article appearing in the May 13 issue of the *Journal of the American Medical Association,* Dr. J. Arthur Myers, Professor of Preventive Medicine, University of Minnesota, discusses three methods commonly used in determining the presence of infection: the pathological examination, the tuberculin test and the x-ray in the light of present-day evidence.

The pathological examination is described as a highly secure method of detecting the presence of tuberculous infection, but one with a serious handicap in the fact that the majority of infections are located so far from the surface that they are not available for ante-mortem examination.

Dr. Myers presents evidence to prove that the tuberculin test determines with a high degree of accuracy the presence or absence of living germs in the body. He shows its value not only in selecting among children future potential cases, but also in leading to the source of infection. The importance of using an accepted tuberculin, of the proper technic in administering it, and of the proper interpretation is emphasized in the article. The point is made that while the test is not infallible, when it is properly administered and the individual does not react, there are, with rare exceptions, no living tubercle bacilli in the body.

The physical limitations of the x-ray such as the fact that it is usually limited to the chest and to a single film of the chest in which a considerable part of the lung is obscured from view by the shadows of the heart, diaphragm, etc., are stressed. Evidence is presented showing that the x-ray examination is effective in finding only from 20 to 25 per cent of the lesions of primary tuberculous infection.

In his conclusion, Dr. Myers makes a point it is well for all to remember. There is no short cut to the diagnosis of tuberculosis. Before a final diagnosis is made all procedures should be utilized and every bit of evidence carefully assembled and analyzed.

E. A. M.

THE MINNESOTA PROGRAM FOR CARE OF THE PREMATURE INFANT

THE Division of Child Hygiene, Minnesota Department of Health, in coöperation with the Minnesota State Medical Association and the Minnesota Hospital Association, has planned a program for improvement in the care of premature infants in Minnesota. This plan contemplates the sending of a specially trained pediatric nurse to the hospitals of the state, in rotation, to introduce the newer ideas and methods for care of the premature baby. The program is, then, in the nature of postgraduate education for those in our hospitals actually engaged in the care of the newborn.

The nurse selected for this work, Miss Gertrude Carlsrud, R.N., has a fine background of several years' experience as pediatric nursing supervisor at the University of Minnesota Hospitals. She has recently completed a period of training in the care of the premature infant under Dr. Julius H. Hess at the Sarah Morris Hospital Premature Station, Chicago, and is now engaged in the work of this new program in Minnesota.

The justification for this project lies, first, in the relative importance of prematurity as a cause of infant mortality and, second, in the demonstrated preventability of many of the deaths due to this cause. While infant mortality in Minnesota has shown a steady decline for many years and has reached the exceedingly low rate of 38.7 deaths per 1,000 live births in 1938, this decline has occurred largely because of the reduction of deaths among infants aged two months to one year. In the newborn period, however, there has been considerably less change and the causes for these early deaths are found to be prematurity, congenital malformations, birth injuries and diseases peculiar to early infancy. Of these, prematurity is by far the most prominent. A recent tabulation of the causes of infant deaths during the first month of life for the triennial period 1936-38, prepared by the Division of Birth and Death Records and Vital Statistics of the Minnesota Department of Health, showed that premature birth was reported as being responsible for over 53 per cent.

Dr. Julius H. Hess is primarily responsible for the demonstration of the preventability of deaths among prematurely born infants. In his work at the Sarah Morris Hospital Premature Station, Chicago, he has developed a system of nursing care for premature infants which has been very successful in reducing the premature death rate. This work has been repeated in several other places and notable among these is the work at the Minneapolis General Hospital under the direction of Dr. A. V. Stoesser. The deaths of premature infants in this hospital have been reduced from approximately 60 per cent in 1930-31 to 13 per cent in 1936-37.

Minnesota has long been a leader among the states in the reduction of infant mortality. It is significant, then, that so large a proportion of our present rate is due to prematurity. The successful operation of this program offers the hope of a further substantial reduction in the infant mortality rate for Minnesota.

A. J. Chesley, M.D.
Secretary and Executive Officer
Minnesota Department of Health

PNEUMONIA SERUM DISTRIBUTION

The State Board of Health met with the Councilors June 1, 1939, in executive session for discussion of Public Health activities and policies, the Council acting in advisory capacity to the State Board. Dr. Owen W. Parker, President, Dr. O. O. Larsen, Vice President, and several members of the Board of Directors of the Minnesota State Sanitary Conference called a luncheon session which was attended by forty medical health officers from different parts of the state on June 2, 1939, for a similar discussion. Surgeon C. R. Coffey of the United States Public Health Service, representing the Surgeon General, attended both of these sessions.

The most important decision relates to the pneumonia program of the State Board of Health.

The Legislature was unable to grant the Board's request for additional funds for the pneumonia program, one item of which was $20,000 per annum for pneumonia serum. The item in the Board's budget "Providing Free Antitoxin and Other Biologics and Chemiotherapy for Communicable Disease" is the only one that was not reduced for the present biennium and this was due to the efficiency and unremitting effort of Dr. L. L. Sogge, Chairman of the Legislative Committee of the State Medical Association and also of the State Sanitary Conference, and Mr. F. Manley Brist, who spent the night at the end of the session with the conferees who set the amounts for State Department appropriations which were agreed to by the Legislature and included in the Appropriations Act for the biennium beginning July 1, 1939.

Unless some emergency should arise, such as a diphtheria outbreak, the Board expects to be able to use some of the biologics fund for the purchase of pneumonia serum and if the Surgeon General approves its request will have several thousand dollars additional available for serum. But the experience to date in the distribution of the serum and expectations as shown by the increase in the typing service and the resulting need for serum shows that it will be absolutely necessary to limit the serum provided to Types I and II as long as the available funds last. And it was definitely decided that free serum for pneumonia patients should be restricted to those who were unable to pay for serum. The Board in coöperation with the Medical Association officers will endeavor to secure a definite policy through the State Relief Agency providing for county welfare boards to bear the cost of serum and report on this subject will be issued in the journal later.

The Division of Preventable Disease in its Main Laboratories began pneumococcus typing and distribution of therapeutic serum through the aid of federal funds supplied by the Public Health Service in January, 1937. The work grew rapidly due to a real need for this service throughout the state. Experience soon proved that typing could be carried out on sputum sent to the Main Laboratories from the most distant points and therapeutic serum could be supplied within ninety-six hours of first symptoms. A twenty-four hour laboratory service has been maintained. The growth of the service is indicated by the following:

	Specimens Submitted for Typing	Persons Serum Distributed	San. Dist.	Counties
1937	664	128	73	39
1938	2,025	583	392	75
1939 to June 1,	641	692	304	76

The State Medical Association "Public Health package" carried material in January on pneumonia, so the physicians of the state are quite familiar with the situation and the public has been advised by the physicians and through the use of the moving picture "A New Day." The members of the Legislature were sympathetic and interested in the program, realizing the need of the service and the large number of deaths from pneumonia that occur annually in the state, but felt that the financial conditions were such that the Board's request for additional funds for the pneumonia program could not be granted. Therefore, the coöperation of all physicians with the State Board of Health is earnestly requested to make the serum which can be provided with the limited funds do the most good. The typing service will be continued without curtailment on a twenty-four hour basis.

The Board will have difficulty in carrying its present services with the reduced appropriations for the biennium. If reduction in any service becomes necessary due notice will be given to the physicians of the state.

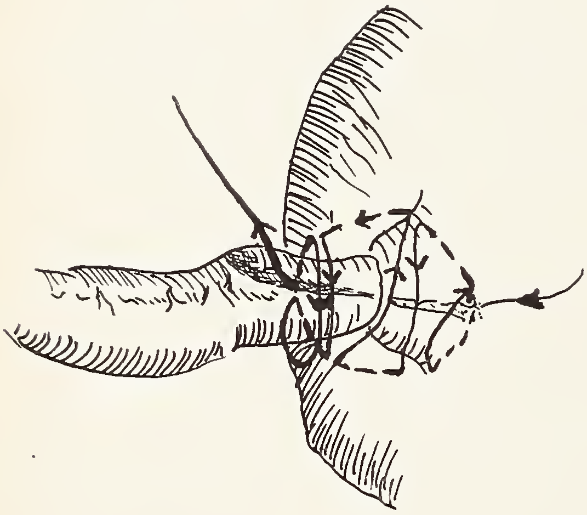
MISCELLANEOUS

A DOUBLE-INVAGINATING PURSE-STRING SUTURE

Francis E. Kibler, M.D.

Austin, Minnesota

FOR the past two years the author has used this particular type of purse-string suture to the exclusion of all others, and has avoided the difficulties and complications frequently attributed to the usual simple purse-string suture.



The method was first demonstrated by the late Dr. Van Meter, of Denver, Colorado. No description of this technic has, to my knowledge, ever appeared in any surgical textbook or journal.

As far as can be determined, this procedure is a modification and definite improvement of the Fabrique method.

The advantages of this suture technic over both the circular and Fabrique methods are two-fold: (1) a double-invagination of the stump is possible without assistance, and it obviates the necessity of placing a second purse-string for those who are so inclined; (2) a smaller area of bowel is incorporated in the suture line, thus lessening the possibility of ischemic necrosis of the bowel wall with its serious and embarrassing consequences. All this is done quickly, no extra bites are necessary in the bowel wall, and the distortion is no greater than that produced by the simple circular suture, and the double security offered is evident.

This purse-string is begun by taking a small bite into the serosa and muscular coat of the cecum 0.5 to 1 centimeter from the base of the appendix (just as in starting the usual type). The suture, however, is reversed and the second bite is taken adjacent to the first but across the mid-line, and directed up the opposite half of the circle. Each succeeding stitch is reversed across the mid-line and taken in the wall opposite the preceding one, until the two half-circles meet opposite the original starting point. This amounts to a circular placement of the Cushing intestinal suture.

The ligated appendix is then amputated at the neck, the stump carbolized and buried by the simple expedient of pulling on the opposing suture ends, which are then tied, and the primary suture line is itself invaginated.

The primary invagination may be aided by a forcep on the appendiceal stump.

The accompanying drawing illustrates this suture technic. Arrows indicate the direction of the suture, the dotted lines indicating the subserosal portion, while the solid line represents the loops.

OF GENERAL INTEREST

Dr. Wm. McLane, formerly of Jackson, Minnesota, has moved to Perham, where he has begun the practice of medicine.

* * *

Dr. C. B. Will has recently established offices at Bertha, where he will be associated in practice with his uncle, Dr. W. W. Will.

* * *

Dr. R. W. Merrill, a graduate of the University of Minnesota, recently became associated with Dr. John F. Cumming at Morris and Chokio.

* * *

Dr. Robert Schmidt of Glencoe, University of Minnesota, 1939, and Dr. Ira Wilson of Rochester, University of Minnesota, 1934, joined the staff of the Worthington Clinic Hospital, Worthington, Minnesota, July 1. The staff now numbers six physicians.

* * *

Dr. J. C. Rothenburg of Springfield completed fifty-four years of active practice the week of June 15. He is planning to retire in the near future.

* * *

Dr. Horace Newhart was elected president of the American Otological Society at its seventy-second annual meeting at Westchester Country Club in Rye, New York. This is the oldest society of its kind in the world.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
W. F. Braasch, M.D., Chairman

ACTION BY THE DELEGATES

From the point of view of national policy the most important action taken by the House of Delegates in session at Minneapolis was its endorsement of the opposition of the American Medical Association to the Wagner Health Bill.

Coming in the midst of hearings before the Senate committee in Washington this endorsement had an especial weight and significance.

The resolution was drawn up by the Hennepin County Medical Society, approved by the Council and passed without a dissenting vote by the delegates. It reads as follows:

> WHEREAS, there is now pending in Congress a measure known as the Wagner bill (S. 1620), entitled the National Health Act of 1939, which contains many provisions which we believe are unwise and unworkable either from a public health or an economic standpoint; and
>
> WHEREAS, the bill makes no provision for use of existing unused hospital and treatment facilities; and
>
> WHEREAS, the bill obviously leads by indirection to compulsory health insurance, to which the medical profession is definitely opposed; and
>
> WHEREAS, the House of Delegates of the American Medical Association in its recent session held in St. Louis, while affirming its continued willingness to coöperate with all government agencies in the legitimate handling of public health problems, took a definite stand in opposition to the Wagner bill in its present form; therefore be it
>
> RESOLVED, by the Minnesota State Medical Association that S. 1620 will not promote the public interest in economics or health; and be it further
>
> RESOLVED, that we endorse the action of the American Medical Association in its opposition to S. 1620; and be it further
>
> RESOLVED, that our Senators and Representatives in Congress be apprised of this action and requested to use all possible efforts to secure such modification of S. 1620 as will bring it into conformity with the principles adopted by the American Medical Association and the Minnesota State Medical Association, or, failing in that, to oppose its passage.

Program and Policies

Proceedings of the House of Delegates will be printed in full in an early issue of MINNESOTA MEDICINE. The following high lights are presented in order to give a general picture of the work of the Minnesota State Medical Association, its policies and future program.

A policy of "watchful waiting" on the question of sickness insurance was adopted upon recommendation of the Committee on Medical Economics.

This policy is based on Minnesota's unique morbidity and mortality rates under our present system of close coöperation with official agencies and on a careful study of information received from doctors, hospitals, nurses, welfare boards and school heads from all over the state, gathered in the course of the statewide Survey of Need and Supply of Medical Facilities just completed by the committee.

Present Methods of Practice Require No Radical Change

"In the main, the doctors, institutions and lay groups who reported to us in the recent statewide survey of medical care are satisfied with our present methods of distribution of medical care," Dr. W. F. Braasch of Rochester, chairman of the committee, reported to the delegates.

"Some plan for adjustment of professional fees where such adjustment is needed, together with hospital insurance, would seem to go a considerable way toward solving the problem of medical costs for most people.

"In view of the fact, however, that many of these plans, and also straight health insurance plans which are being tried out in a number of other states, are still in the experimental state, it seems wise for us in Minnesota to see how they work out before promoting any of them," he declared. "In Minnesota, with our low morbidity and mortality records, we can well afford to remain for the time being in the rôle of observers." (A résumé of the results of the Survey as printed in the May issue of MINNESOTA MEDICINE was distributed to the delegates.)

No Need for Haste

Representatives of the Farm Security Administration have several times appeared before the Council and the Sub-Committee on Low Income and Indigent Problems requesting establishment of some form of medical coöperative by which Farm Security Clients might secure medical care on a pre-payment basis, according to Dr. W. A. Coventry of Duluth, chairman of the committee. The committee has studied the situation in Minnesota and also reports of plans in operation in other states. In Minnesota, there is a total of 7,286 farmers under jurisdiction of the Farm Security Administration. Of this total, 1,350 are in the territory of the Upper Mississippi Medical Society, which includes sparsely settled regions with considerable inferior farming country, 659 are in the East Central Society, and 720 in the Red River Valley Medical Society. No requests have come from any of these farmers themselves nor from officials or physicians from the communities affected. It is the feeling of the committee, therefore, that no plans should be hastily formulated or pushed. The needs of these people are being met at the present time by the regularly constituted agencies and new plans can be formulated when these agencies are shown to be unable to carry the load.

Free Choice Guaranteed

Dr. B. B. Souster, St. Paul, secretary of the association, reported that the position of the physician in the administration of relief and social security aids is now well established in Minnesota.

The relief law, which for two years has guaranteed to relief clients their "choice of vendor," was further clarified at the last session to specify that this choice applies to services as well as to supplies, thus ending all controversy as to whether the choice of vendor clause applies to physicians' services, Dr. Souster declared. With the exception of the larger cities where free outpatient clinics have been established for many years, the needy now have their choice of physician in every county in the state where state aid is accepted.

Private Medicine Intrenched

"The system of private medicine working closely with official agencies in the handling of public charges is probably more firmly intrenched in this state than ever before," he said, "and the future policy of the state medical association undoubtedly lies in the development of this system rather than in doubtful and expensive experimentation that may well operate, in the end, to disturb favorable record and lower standards of care in the state."

Appreciation was expressed by Dr. Souster for the close coöperation of the State Department of Health and the State Board of Control and the State Relief Administration.

An increase of 125 members, largest increase in the history of the organization, was reported for 1938 and 1939.

Surplus

The good financial condition of the association was noted by the treasurer, Dr. W. H. Condit of Minneapolis. The year ended with a substantial surplus, Dr. Condit reported. The deficit of the year before was paid out of this surplus and the remainder was used to purchase bonds to be added to the permanent investment fund of the association, representing the first addition in many years made to this fund.

The most important organized activity carried on by the medical profession in Minnesota is public health education, according to the report presented by Dr. L. R. Critchfield.

Public Understanding Necessary

He advocated expansion of the present educational program of the association, which now includes radio programs, a news service, college lectures and the new coördinated program by which every county medical society in the state lends assistance to the committee in an educational campaign on one subject each month. A share in Minnesota's low death and disease rates is credited in the report to the organized efforts of the doctors.

"Events in Washington and widespread lay discussion of medical care merely emphasize the need for a better public understanding of the fundamentals of health protection," according to the report. "It is generally agreed that a large section of the population undoubtedly stands in need of medical care but is not sufficiently instructed to secure such care. For these people, vast new facilities contemplated in the Wagner Health bill will be of no use. What they need is education, and it should be the personal obligation of every physician to aid in extending it."

Personal instruction of patients and organization in their own communities was urged upon association members.

Removing Cancer Fear

To remove public fear of cancer and to substitute for it an enlightened knowledge of how to control and cure malignant disease was defined as the current aim of the Committee on Cancer, of which Dr. Martin Nordland of Minneapolis is chairman.

To put this program into practice the committee worked closely with the Women's Field Army Against Cancer. It aided, also, in preparation of material for the state association's cancer education month in April and provided speakers for meetings on the subject throughout the state. Every physician was urged by Dr. Nordland as chairman to assist the Field Army in its campaign.

Fracture Program

Improvement on a statewide scale in the handling of fractures is the objective for next year of the Committee on Fractures, of which Dr. F. J. Elias is chairman.

The first step was the organization of fracture committees in each county medical society which was initiated at the fracture dinner held Wednesday night, May 31, in Minneapolis, with Dr. Charles L. Scudder of Boston as speaker. These committees are to have a two-fold function as reported by Dr. Elias: to keep their respective societies up to date on any new developments in the medical and surgical repair of fractures and to supervise closely the handling of first aid for fracture victims, particularly traffic fractures.

The extensive program on fractures which was a feature of the 86th Annual Meeting was sponsored by the committee.

Finding Defective Children

Funds should be made available, if possible, for finding children in rural areas, particularly, who are hard of hearing; also for correcting their hearing defects, Dr. Horace Newhart of Minneapolis, chairman of the Committee on Deafness Prevention and Amelioration, declared in the course of his report to the delegates. In this connection, the following resolution was passed at his suggestion:

> The Minnesota State Medical Association approves and recommends the granting of funds by the Foundations and other appropriate agencies for the encouragement and administration of well coördinated programs for the early detection of visually and orally handicapped school children and those threatened with such handicaps and for the needed corrective medical care of indigent and under-privileged children so handicapped, such programs to be carried out by local and state agencies under guidance of specially qualified, regularly certified physicians.

A new audiometer for detecting hearing loss is now available at a moderate price, according to this report. By means of it the hearing of large numbers of children can be accurately checked in a minimum period of time. Purchase of this instrument is now possible for small communities.

Postgraduate Courses in Venereal Disease

A series of one-day courses on control and treatment of venereal diseases will be given for doctors in all parts of the state next October, the Committee on Syphilis and Social Diseases, of which Dr. F. W. Lynch of St. Paul is chairman, reported to the delegates.

These courses will be sponsored by the committee, the University medical school and the State Department of Health. They are scheduled for next October to coincide with the campaign of public education on the same subject planned by the association for that month. Federal funds will be used to finance the lectures.

Minnesota has for many years had an effective program for the control of venereal disease, Dr. Lynch reported, and the number of new cases reported each year is lower than in many other states. No legislation for pre-marital Wassermann tests will be advocated by the committee for Minnesota; but if such legislative action should be proposed in the future from any other quarter the committee urges physicians to direct it along reasonable and practical lines.

A new and up-to-date edition of the booklet on diabetes which was published by the Committee on Diabetes several years ago will be undertaken this year, the committee announced to the delegates. The booklet will be available, as formerly, to any patient through his own physician.

For Aviation Medicine

The Medical Reserve Corps lacks sufficient funds to train reserve officers in aviation medicine, according to the Committee on Military Affairs. Only one applicant in the Seventh

Corps Area received active duty training in aviation medicine last year and several others of the grades of captain and first lieutenant passed all requirements but were denied training because of lack of funds. A resolution was accordingly approved by the House of Delegates at the request of Dr. F. L. Smith of Rochester, chairman of the committee, asking Congress for sufficient funds for training one reserve officer for each reserve area in the United States and for each military department of the insular possessions in this important new branch of medicine.

There are now 675 Medical Department Reserves on active status in the Army and Navy, Dr. Smith reported, and 585 officers. There has been a decided increase in promotions of officers in the reserve during the past year.

Doctor Mayo

Among important resolutions passed by the delegates was the following on the death of Dr. C. H. Mayo:

> Whereas death has removed from us Dr. Charles H. Mayo, a great humanitarian, a world-renowned surgeon, a beloved member and former president of our association and
>
> Whereas Dr. Mayo and the great institution which he helped to establish has brought world recognition, greater scientific knowledge, greater opportunity for professional attainment and progress to every physician in Minnesota, and
>
> Whereas Dr. Mayo had ever at heart the welfare and interests of this association, of his colleagues in Minnesota, and seldom failed to attend these annual sessions,
>
> Be It Resolved that in his passing the world has lost a great leader, and the doctors of Minnesota a friend, a teacher of high professional attainments and a distinguished exemplar of the lofty ideals of a great profession whose memory will ever remain with the members of this House and this association as an inspiration and guide.

A resolution of regret at his retirement from office and from active practice was also sent to Dr. J. T. Christison of St. Paul.

Resolutions of appreciation for their assistance and for their sympathetic coöperation were ordered to be sent to the State Board of Health and Dr. A. J. Chesley, executive officer, and to Dr. S. E. Gilkey, Medical Director of the State Relief Administration. A resolution was also passed petitioning for an immediate appropriation for a new building to House the Army Medical Library previously authorized by Congress.

RECENT PROGRESS OF THE WAGNER HEALTH BILL

Of outstanding importance to the future welfare of medicine is the stand taken by the House of Delegates relative to the Wagner Health Bill at the recent convention of the American Medical Association. Although the members of the House of Delegates at their meeting last October expressed their approval of most objectives included in the National Health Program, they did so with some definite and important reservations. These reservations, as well as other observations made, were completely ignored in drawing up the Wagner Bill. At their recent meeting the delegates took quite a different stand toward the Federal Health Program as expressed in the Wagner Bill. A resolution was introduced by Dr. Walter Donaldson, and supported by the delegates without a dissenting vote, in which the Wagner Bill was condemned in no uncertain terms and with twenty-two specific reasons given for their action. There may have been a few delegates who had dissenting opinions, but if so they did not care to assert themselves in view of the overwhelming majority of opinion.

The Wagner Health Bill is generally considered to embody most of the features of the Health Program of the Federal Interdepartmental Technical Committee. Denials have been made by members of the Public Health Service that they are responsible for the present form of the bill. In fact, it has been stated that they were not even consulted in drawing up the bill. However, most of the evidence would lead to the conclusion that this bill has met with the approval of those who are pushing the National Health Program.

A perusal of the records of hearings held before the Senate Committee which has the Wagner bill in charge is most instructive and illuminating. In the first place, one gains the impression that the members of this committee are well-meaning gentlemen who really have the best interests of the public at heart. They apparently have given the matter considerable thought and from the layman's standpoint might be regarded as fairly well informed on many phases of the subject of the care of health. It is a curious thing, however, that men who undoubtedly are well versed in the ways of the world should have introduced a bill on a technical subject which did not have the advice or counsel of experts who are most interested. They probably thought they had done so when they received counsel from the Public Health officials and from the economists and social workers of the Security Board. It does not seem possible that a bill fraught with such grave importance to the public health and to medicine in the future should have been introduced without a conference with the men who have had charge of medical care throughout these years. The only opportunity which organized medicine has been given to present any evidence as to the wisdom of the laws proposed in the bill was at the hearing after it had been introduced. This simply does not make sense, but it is in keeping with the ruthless methods adopted by the small group who are controlling the health program sponsored by the Security Board.

One opportunity was given previously for presenting evidence by representatives of the medical profession and the American Medical Association. This was at a so-called Conference held in Washington under most adverse circumstances and after everything had been previously decided. The public has not been informed of the arbitrary methods employed in establishing the National Health Program. The members of the senate committee learned one thing, however, and that is that the best informed physicians throughout the country, who are quite in sympathy with some of the objectives of the Wagner Bill, are opposed to its present form. The senate committee learned that most doctors hold these opinions, not because they are members of the American Medical Association, or might be controlled by an alleged hierarchy in that Association, but that these opinions were their very own and were shared by the vast majority of practicing physicians. The members of the committee apparently are blind to the implications of the bill which menace the future of medicine. This is easy to understand, since the average layman cannot conceive of the dangers involved in governmental control of the practice of medicine. They do not seem to realize that opposition to the Bill on the part of the rank and file of practitioners is largely on idealistic grounds, namely that they fear that medicine itself would suffer. That is something which is difficult for the average layman to believe.

Another interesting feature of the senate inquiry was the fact that there was little unanimity among the physicians who spoke in opposition to the Wagner Bill regarding suggestions as to desirable changes in the Bill. Before another hearing is held it would be well to agree upon some common plan, or on certain principles which could be agreed upon by all. Apparently, the suggestion made by that able representative of medicine, Morris Fishbein, to the effect that the present bill be checked and entirely rewritten with the advice and counsel of representatives of medical practice, is the one that will be adopted. If the senate committee is really in earnest in its desire to improve the status of health, it will seek the information available in the medical profession and have frequent conferences with chosen representatives before another bill is introduced. They will also consult the vast amount of information available at the headquarters of the American Medical Association and the specialists who have this in charge. They could learn a great deal from the Survey of the Supply of Medical Care which recently was conducted under the guidance of the Bureau of Medical Economics of the American Medical Association. In fact, the answers to many of the questions which the senators raised in regard to the methods of improving public health are given in the suggestions made in the surveys of various county and state medical societies. One can point to no better direct answer for the best method of improving medical care, for which there unquestionably is need, than a perusal of the suggestions made by the Economic Committee of the Chicago Medical Society which have recently been published. Information made available by the American Medical Association Survey is most illuminating and far-reaching and undoubtedly offers more accurate data concerning the status of medical supply and the needs and ways for improvement than have ever been accumulated. This survey includes data which are so much at variance with the results of the National Health Survey as to make the latter appear quite unreliable and in fact ridiculous.

It has been reported that the Wagner Health Bill will not be reported out of the Committee at this session of Congress and will not be voted on. This is to be hoped for, so that time will be given for a thorough consideration of the problems involved by all those interested.—W.F.B.

UNIQUE CONFERENCE

The Conference on Medical Problems held Friday, June 2, at the Minneapolis Auditorium presented a series of significant papers on the issues presented to the American people by the Wagner Health bill now before Congress.

Probably no more important or comprehensive statements of the varying viewpoints of principal agencies involved in the proposed program have ever been presented on one platform. The papers presented there by Surgeon E. R. Coffey of the United States Public Health Service (substituting for Assistant Surgeon General C. E. Waller); Dr. F. W. Jackson, deputy minister of health and public welfare of Manitoba; Monsignor Maurice F. Griffin, vice president of the Catholic Hospital Association; Dr. F. S. Chapin, chairman of the Department of Sociology at the University of Minnesota; President George Earl, and Senator Henrik Shipstead will be published in subsequent issues of MINNESOTA MEDICINE. They are not abstracted here because they should be read in full by every physician who is interested in the future of American medicine.

A large audience made up of nurses, social welfare workers, hospital administrators, dentists and druggists, as well as members of the association, remained throughout the day for this conference, which brought a unique meeting to its official close. Dr. F. J. Savage presided at the morning session, and Dr. W. F. Braasch in the afternoon.

THE COUNCIL MEETS

May a single group of doctors, with the approval of the Council, set up a coöperative medical service in their own community?

The policy of the Council, enunciated as follows in response to this question, will serve as a guide for any group or any community that may wish to experiment with new methods of payment for medical services:

> "Following the action taken by the House of Delegates of the American Medical Association in special session, February 15 and 16, 1935, which reaffirmed 'encouragement to local medical organizations to establish plans for the provision of adequate medical service for all of the people, adjusted to present economic conditions, by voluntary budgeting to meet the costs of illness,' the Council also records no objection to coöperative or insurance plans for medical services in any county provided they are approved, sponsored and directed by the county medical society concerned. It is opposed to any private venture by a single doctor or group of doctors which is not approved by the local county medical society."

It was further specified that any member of the society who might wish to enter should be included in the plan.

To Study Tests for Alcohol

A committee to study motor vehicle accidents and coöperate with authorities especially on the problem of alcoholic tests for drivers involved in accidents was approved by the Council. The president was instructed to appoint such a committee.

This action was taken because of impressive findings submitted by the American Medical Association's Committee to Study Motor Vehicle Accidents at St. Louis. This report showed, by tests made of the breath of 1,750 drivers chosen at random on the streets of Evanston compared with similar tests made on 270 drivers brought to Evanston hospitals after involvement in personal injury highway accidents, that 47 per cent of the drivers involved in accidents had alcohol in their blood, while only 12 per cent of the drivers selected at random had been drinking. Assuming that the chance of having an accident when no alcohol has been consumed is represented by the figure one, the chance of having an accident is 55 times greater when the average driver has 0.15 per cent or more alcohol in his blood.

The new committee will be appointed shortly. It will be instructed to coöperate with the authorities in developing satisfactory tests and in controlling the alcohol problem.

Complaint

A formal complaint by the Redwood-Brown County Medical Society concerning lack of cooperation on the part of interns and fellows of the University Hospital and also unethical remarks to patients concerning referring physicians was brought before the Council and later discussed at length at a breakfast meeting to which University Hospital officials were invited. The problem was shown to be one of education in ethics, chiefly, and a renewed effort was promised to instruct the changing groups of interns and fellows on the University Hospital services in the fundamentals of courtesy and ethics toward all physicians, and particularly toward referring physicians whose patients are treated in the University Hospital. The shortness of stenographic help, which sometimes makes adequate reporting to referring physicians by staff members extremely difficult, was emphasized to the Council. The University Hospital is over-crowded with a constant waiting list of approximately 600. Special instruction on ethical procedure in relationship to other physicians was suggested for the hospital staff meetings.

Group Hospital Insurance

Group hospital insurance is being extended gradually by the Minnesota Hospital Service Association to communities outside the three large cities.

An application from one hospital in the state for approval by the Council was answered by the following motion which was read before the House of Delegates in subsequent sessions and which was designed to serve as a guide for any hospital or community which might be considering extension of hospital insurance:

"It is the sense of the Council that extension of hospital insurance through the Minnesota Hospital Service Association to the hospitals of any community in the state is entirely a matter for local handling and decision, and should be approved by the component medical society concerned."

To Study Sex Crime

At the request of the Minnesota House of Representatives the Council empowered the President to appoint a committee to act with a similar committee from the Minnesota State Bar Association in a study of future legislation for control, regulation, segregation and treatment of persons afflicted with psychopathic personalities, particularly of potential sex criminals. Constitutionality of the preliminary legislation allowing for apprehension of potential sex criminals which was passed at the last session has been brought by test case before the Supreme Court of the state and now awaits ruling of the court.

Disciplinary Action Recommended

Two complaints concerning failure of some physicians to comply with the laws were received by the Council.

One, from the State Board of Health, concerned failure to record births. The law requires all physicians to record every birth they attend, and failure to do so renders them liable to penalty. The importance of complete birth records not only to vital statistics and thus to medical knowledge, but to the social security and old age benefit record of the individual, is obvious. It should not have to be argued to physicians. The Council recommended that physicians who fail to comply with the regulation be reported for disciplinary action by the State Board of Medical Examiners.

The second concerned refusal of a considerable number of physicians, reported by the Minnesota State Pharmaceutical Association, to comply with all provisions of the new barbital legislation. All physicians recognize the danger of unrestricted sale of barbital derivatives and every member of this association should be scrupulous in doing his part to carry out the law. In this case, also, the Council recommended that the pharmaceutical association be instructed to inform the State Board of Medical Examiners promptly concerning violations by physicians.

Distinguished Service Medal

The distinguished service medal and scroll presented by the Minnesota State Medical Association to members for special contribution to the work of the association was voted by the Council to Dr. W. J. Mayo and to the late Drs. C. H. Mayo and H. M. Johnson. Photographs of each of the three will also be hung at the medical school of the University of Minnesota.

Council to Act

Several matters concerned with the policies and program of the State Board of Health were brought before the Council by Dr. A. J. Chesley, executive officer, and by members of the Board.

A committee composed of physicians and lawyers for study of needed changes in certificates and procedure for registration of births was approved.

It was decided, also, that the Council as a whole would constitute itself as a committee to advise with the Board in any difficulties that may arise between the Board and the officials of federal or state agencies, particularly in the matter of narcotic violations.

A bill relating to control of silicosis and dust diseases in Minnesota is under consideration as part of the program of the Board on Industrial Hygiene and was referred to the Committee on Public Policy for study.

Pneumonia Program Curtailed

The pneumonia control program will be affected seriously by the recent legislative curtailment of the Board's budget, the Council was told. Pneumonia serum can no longer be furnished on the former scale; but the Council approved continuance of the program to a limited extent. In accordance with this limited program, a small amount of serum will be made available through other biological funds. It will be provided free as far as possible, to those who cannot pay for it themselves. Serum will also be supplied at the reduced price secured by the Board to anyone who can pay for it. The diagnostic centers will be maintained throughout the state and arrangements will have to be made for prompt typing service to avoid delay. The cost of the serum used this spring has run between $3,000 and $4,000, the Council was told. It was suggested that arrangements might be made through County Welfare Boads to secure serum for relief clients.

Control of Venereal Disease

At the request of Board members the venereal disease control program was reviewed by a special committee of the Council and the following recommendations were proposed and approved:

1. That free drugs for treatment be supplied only to those who are unable to pay for them.
2. That the present level of efficiency of laboratories used to make blood tests is satisfactory. However, standardization of laboratories is an optional matter and the assistance of the laboratory of the State Board of Health is requested to maintain all on a high level.
3. That a sum of money be set aside in the budget of the State Board of Health whereby physicians may be compensated for treatment of needy cases in accordance with a plan to be worked out by the Minnesota State Medical Association and with the money to be made available to the physicians through the state association.
4. That no new venereal disease clinic is needed at the present time in Minnesota.
5. That venereal disease should be treated as a matter of policy in the private office of any duly licensed practitioners of medicine.

The program for crippled children in Minnesota was reviewed for the Council by Dr. H. E. Hilleboe, Director of Services for Crippled Children, and approved with a vote of appreciation for Dr. Hilleboe's work.

Committee Enlarged

In accordance with the amendment to the constitution proposed by the Editing and Publishing Committee and passed by the House of Delegates, membership of the committee was increased to ten and the following new members were named by the Council: Dr. O. W. Rowe, Duluth, 1942; Dr. H. W. Meyerding, Rochester, 1939; Dr. P. F. Donohue, St. Paul, 1943; Dr. C. L. Oppegaard, Crookston, 1940; Dr. B. O. Mork, Jr., Worthington, 1941.

"THE X-RAY BURN"

(Monthly editorial prepared by the Medical Advisory Committee)

In meeting large numbers of medical men attending medical conventions, one is struck by the great number of these men who show evidence of x-ray burns of the hands. This is especially evident, of course, among the older men who, through lack of knowledge of the potential seriousness of the frequent exposures without precautionary measures, exposed themselves to the rays, and burns of varying degrees resulted.

Your Medical Advisory Committee wishes to bring to the attention of the membership the possibility of serious untoward results from too frequent exposure of the accident case to x-ray in the taking of plates and doing fluoroscopic examinations. A case in point—this patient seriously injured through the pelvis and spine had six x-rays taken by his local physician. It was decided to take him to a consultant. Here, several more exposures were made and then he was entered in a hospital where, in order to complete records, he was again x-rayed. In all, some twenty exposures were made of his pelvis and back in forty-eight hours. Then within the week, in order to follow the healing process, more x-rays were made. An exaggerated case maybe, but well within the realm of actual happening. Would we be surprised if this man should show as the result of these multiple exposures an x-ray burn in a few months or that the sex glands might be seriously affected? As we all know, certain individuals have a marked idiosyncrasy to the x-ray, and more caution should be exercised with these patients than others.

Since these instruments of precision have possible sources of trouble easily overlooked in the hurry of active medical practice, we bring this thought to the membership at this time believing that "an ounce of prevention is worth" the proverbial "pound of cure."

As the spirit of coöperation becomes more and more evident among our membership, the frequent exchange of radiographs as a patient is transferred one to the other could be made with advantage not only to each surgical consultant but would surely prove better for the well-being of the patient.

The indemnity insurance carriers deplore the number of x-ray burns that they are called on to pay for. We can reduce premiums by lessening their frequency.—B.J.B.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Osseo Farm Woman Sentenced to Four Year Prison Term

State of Minnesota vs. Anna Powers.

On June 9, 1939, Anna Powers, forty-nine years of age, was sentenced to a term of not to exceed four years at hard labor in the Women's Reformatory at Shakopee, Minnesota, for the crime of abortion. Mrs. Powers entered a plea of guilty on June 1, 1939, after a jury had been selected to try her on a charge of manslaughter in the first degree, following the death, on April 2, 1939, of an eighteen-year-old northeast Minneapolis girl at the farm home of the defendant near Osseo, Minnesota.

The investigation conducted by the Minnesota State Board of Medical Examiners, in coöperation with the sheriff's office and the county attorney's office of Hennepin County, disclosed a number of women, who, upon being questioned, stated that criminal abortions had been performed upon them by the defendant. Shortly after the arrest of the defendant, the young man who stated that he paid Mrs. Powers $75.00 for the abortion in the case that resulted in the prosecution of Mrs. Powers, was found on a road in rural Ramsey County, with a bullet wound in his chest, which had been self-inflicted. The young man, however, made a remarkable recovery and the defendant, upon seeing the number of witnesses for the state on the date the trial opened, changed her mind and plead guilty.

Mr. Herbert T. Park of Minneapolis, one of the attorneys for the defendant, made a rather lengthy plea to the Court in which he asked that the sentence be suspended and the defendant placed on probation in his care. Mr. Park's plea was immediately denied by Judge Baldwin, who pointed out that the state had shown the defendant a great deal of consideration by permitting her to plead guilty to abortion rather than manslaughter. Judge Baldwin also pointed out that the state had available, in the event of trial, a number of witnesses who would testify to other abortions.

The Minnesota State Board of Medical Examiners is very grateful for the coöperation shown by Inspector Andrew Crummy of the county attorney's office, and the splendid handling of the case by Mr. Arthur Markve and Mr. Per Larson, assistant county attorneys. Fine coöperation was also received from Drs. Gilbert Seashore and C. A. Hobbs, Coroner, and Deputy Coroner, respectively of Hennepin County.

Minneapolis Chiropractor Pleads Guilty to Unlawful Possession of Abortion Instruments

Re: State of Minnesota vs. Michael John Koehler

On May 24, 1939, Michael John Koehler, forty-two years of age, a licensed chiropractor with an office at 321 Kresge Building, Minneapolis, entered a plea of guilty in the District Court of Hennepin County, to an information charging him with the crime of illegally having in his possession instruments, drugs and medicine, for the causing of unlawful abortion. Koehler was sentenced by the Honorable Mathias Baldwin to pay a fine of $150.00 and to serve a sentence of one year in the Minneapolis Workhouse. Upon the payment of the fine, Judge Baldwin ordered the jail sentence suspended and Koehler placed on probation in charge of the probation officer for Hennepin County. Under the laws of Minnesota, the maximum punishment for this particular offense is a jail sentence of not to exceed one year, or a fine of not to exceed $500, or both.

Koehler was arrested on April 19, 1939, following the issuance of a complaint charging him with performing a criminal abortion on a twenty-five-year-old Minneapolis girl. Upon being arraigned, Koehler entered a plea of not guilty, had his trial set for May 4, 1939, and was released upon $2,000.00 bond. It subsequently developed that the main witness for the state, the girl upon whom the alleged abortion was performed, was a rather unwilling witness for fear that she might cause trouble for the young man named by her as the one who made the arrangements for the alleged abortion. The girl stated to the Minneapolis Police Department that Koehler charged $115.00, including a lady's diamond ring. Because of the reluctance of this witness to testify, Koehler was permitted to plead guilty to the lesser offense.

Sale of "Sekov Reducer" Capsules Leads to Arrest and Conviction

Re: State of Minnesota vs. Mary Petersen.
Re: Sekov Reducer Capsules.

Following a joint investigation by the St. Paul Police Department, the State Board of Pharmacy and the Minnesota State Board of Medical Examiners, Mary Petersen was arrested on May 25, 1939, following the issuance of a complaint charging her with practicing healing without a basic science certificate. The defendant, a married woman, waived preliminary hearing upon arraignment in the Municipal Court of St. Paul, and was held to the District Court. She entered a plea of guilty on May 31, 1939, and was sentenced on June 2, 1939, by the Honorable John W. Boerner, Judge of the District Court, to a term of 1 year in the Women's Reformatory at Shakopee. Because of the fact that the prosecution was instituted as a test case, and the frank statement made by the defendant that, under no circumstances, would she violate either the medical laws or the pharmacy laws of the State of Minnesota, the Court suspended the sentence and placed the defendant on probation for one year under the probation officer of Ramsey County.

The investigation disclosed that Mrs. Petersen came to St. Paul in March, 1939, from Eau Claire, Wisconsin, where she had resided for a year. Prior to that time, Mrs. Petersen stated she lived at Worthington, Minnesota, for four years. She stated at the time of her arrest that she was the St. Paul representative of Sekov Reducer, Hollywood, California. She inserted ads in the local papers representing herself as maintaining a "health studio" at 428 New York Building, St. Paul. This address, however, was simply used as a means of contact with the public, and prospective patients were seen, either at their home, or at the home of Mrs. Petersen. Special appeal was made to those who were over weight. Part of the examination, conducted by Mrs. Petersen, consisted of obtaining information from the patients as to their height, age, weight, and also the following information with respect to the condition of their health: constipation, menstrual disorder, heart disorder, kidney disorder, operations, metabolism test, and particularly whether the patient was taking any other remedy. The patients were given literature indicating to them that by taking Sekov capsules the patients would reduce their weight and thereby avoid such ills "as heart disease, liver and kidney disorders, Bright's disease, high blood pressure, shortness of breath, dizziness, apoplexy, gout, dropsy and arteriosclerosis." Two kinds of capsules were suggested and recommended to the patients, a number 1 capsule to be taken one before the noon-day meal, and a number 2 capsule to be taken every other night just before retiring. The Sekov Company represented to their agents that Sekov "consists of herbs and the following glandular extracts: Thyroid, Ovarian and Pituitary." Mrs. Peterson stated that she was the agent for the St. Paul territory and that she purchased these capsules through a representative of this company in Minneapolis. She also stated that the product was owned by one Hazel Vokes of Hollywood, California, and that Sekov is coined by spelling the name Vokes backward. These capsules were sold to the patient at $5.50 per box, each box containing a thirty days' supply. A three months' supply was sold for $15.00.

The facts in this case indicate, quite clearly, a violation of not only the basic science law of Minnesota, but also the medical act and the pharmacy laws. The defendant in the instant case admitted that she had no training whatsoever in medicine and holds no license to practice any form of healing in the State of Minnesota.

The Medical Board wishes particularly to mention the fine coöperation in this case on the part of the St. Paul Police Department, the State Board of Pharmacy and Mr. James F. Lynch, Assistant County Attorney of Ramsey County.

Jury Disagrees in Trial of Minneapolis Chiropractor

Re: State of Minnesota *vs.* Arthur J. Kolling

After deliberating more than twenty-six hours, a jury of nine women and three men, in the court of Judge Lars O. Rue of the Hennepin County district court, reported that it was unable to reach a verdict on the guilt or innocence of the defendant, Arthur J. Kolling, a Minneapolis chiropractor being tried on an indictment in which he was charged with practicing medicine without a license. The case was given to the jury at 3:30 o'clock p. m. on June 20, 1939, and at 6 o'clock p. m. the next day the jury was discharged by Judge Rue. It is reported that the jury was deadlocked six to six. The case will be re-tried at the September term of Court.

The defendant, who is licensed to practice chiropractic in Minnesota and who owns the Hennepin Clinic at 805 LaSalle Avenue, Minneapolis, was indicted by the Grand Jury on May 16, 1939, on a charge of practicing medicine without a license. The state introduced evidence at the trial that Kolling had sutured a wound of a ten year old boy with surgical catgut. The boy had been injured by an automobile at 8th and LaSalle and removed to the office of the defendant by the office assistant of the defendant. The accident happened at 4:15 o'clock p. m. on April 14, 1939. Despite the fact that the ambulance was called and that the accident occurred within one block of the Medical Arts Building, at a time when hundreds of medical men were available the case was described by counsel for the defendant as an "emergency." The parents of the boy called their family physician who promptly removed the boy to the hospital. On April 28 a statement for "services rendered" in the amount of $25.00 was sent on the stationery of the Hennepin Clinic.

Kolling did not take the witness stand in his own behalf but introduced testimony that the $25.00 charge made was to cover the damage done to his office and his equipment by the boy becoming nauseated, which he estimated at $10.00 and the balance of $15.00 to go to W. D. Hammond, M.D., for services. Dr. Hammond is registered with the Medical Board from 106 Washington Avenue South, which is the location of the Health Institute, specializing in "diseases of men." Dr. Hammond testified for the state and denied the boy was his patient and stated that the suturing was done by the defendant with catgut and surgical instruments owned by the defendant. Dr. Hammond's name appeared on the door of the Hennepin Clinic on that date but he testified that he had no arrangement with the defendant but was considering purchasing the place from Kolling. It also developed that the office assistant of the defendant is the wife of Dr. Hammond. Mrs. Hammond also testified for the state and stated that she was paid $5.00 per week for her services at the Hennepin Clinic.

Kolling was fined $150.00 in 1928 in the district court of Hennepin county following his plea of guilty to a charge of practicing medicine. He was also fined $2,000.00 in 1938 in United States District Court following his plea of guilty to a charge of violating the internal revenue laws of the United States in connection with the alleged diversion of industrial alcohol. Kolling paid the fine and is on probation for 3 years on a suspended sentence of two years in prison in the same case.

List of Physicians Licensed by the Minnesota State Board of Medical Examiners on May 11, 1939

By Examination

Balmer, Albert Irwin, U. of Minn., M.D. 1938, Pipestone, Minn.

Baumann, Milton Charles, U. of Ill., M.D. 1937, Gaylord, Mich.

Beach, Northrop, Harvard Med. Col., M.D. 1938, Minneapolis

Berry, Maxwell Rufus, Jr., Cornell U., M.D. 1935, Rochester, Minn.

Blair, Herbert Milton, U. of Minn., M.D. 1938, St. Paul

Braun, Ohrmundt Carl, U. of Minn., M.B. 1939, Minneapolis

Campbell, Lorne Alexander, Jr., U. of Minn., M.B. 1938, Eloise, Mich.

Chapman, Asher Spaford, Northwestern, M.B. 1937, M.D. 1938, Rochester, Minn.

Chlad, Arnold Joseph, U. of Minn., M.B. 1938, St. Paul, Minn.

Clarke, Eric Kent, U. of Toronto, M.B. 1916, Minneapolis

Clegg, Reed Smoot, Northwestern U., M.B. 1936, M.D. 1937, Rochester, Minn.

Dahle, Manford Benjamin, Rush Med. Col., M.D. 1938, Minneapolis

Dressel, Paul Arthur, U. of Minn., M.B. 1939, Elkton, S. Dak.
Eginton, Charles Theodore, U. of Minn., M.B. 1938, St. Paul
Erickson, John Walfred, Creighton U., M.D. 1938, Minneapolis
Even, Martin Morris, U. of Minn., M.B. 1939, 616 N. 18th Ave. E., Duluth, Minn.
Geib, Marvin Jacob, U. of Minn., M.B. 1938, Minneapolis
Giles, Francis Emmett, U. of Minn., M.B. 1938, Nashwauk, Minn.
Greathouse, John Dallas, Jr., U. of Minn., M.B. 1939, Minneapolis
Griffin, Vernon M., U. of Ore., M.D. 1938, St. Paul
Gullickson, Miles Justin, U. of Minn., M.B. 1934, M.D. 1935, Minneapolis
Hartman, Jack, U. of Minn., M.B. 1939, Minneapolis
Hill, John Roger, Ohio State U., M.D. 1936, Rochester, Minn.
Howe, Rulon Fullmer, U. of Chicago, M.D. 1937, Rochester, Minn.
Huebner, Jewel Steiner, U. of Wis., M.D. 1938, Duluth, Minn.
Johnson, Raymond Alfred, U. of Minn., M.B. 1939, Winthrop, Minn.
Johnson, Vilhelm Manual, U. of Minn., M.B. 1939, Dawson, Minn.
Kapernick, John Stuart, U. of Ill., M.D. 1937, Rochester, Minn.
King, Harry Edward, Western Reserve, M.D. 1936, Rochester, Minn.
Knights, John A., Jr., Geo. Wash. U., M.D. 1936, Detroit, Mich.
Knutson, George Olaf, Northwestern, M.B. 1937, M.D. 1938, Negaunee, Mich.
Kohlmeyer, Frederick Charles, U. of Minn., M.B. 1939, Blue Earth, Minn.
Kyser, Franklin Arthur, Northwestern, M.D. 1938, Rochester, Minn.
Lambert, Lois Ruth, U. of Minn., M.B. 1938, Minneapolis
Lambertus, Paul Theodore, Rush Med. Col., M.D. 1935, Rochester, Minn.
Larrabee, Walter Freemon, Jr., U. of Minn., M.B. 1939, Chippewa Falls, Wis.
Larson, Everel Arthur, U. of Minn., M.B. 1938, St. Paul, Minn.
Licht, Hersh, U. of Minn. M.B. 1938, Minneapolis
Little, Edgar Hugh, Washington U., M.D. 1937, Rochester, Minn.
Llewellyn, Maxwell Bowler, U. of Minn., M.B. 1939, St. Paul, Minn.
Locke, William, U. of Manitoba, M.D. 1938, Rochester, Minn.
Maino, Charles Runston, Stanford U., M.D. 1938, Rochester, Minn.
Mason, Bernard Augustine, McGill U., M.D. 1937, Rochester, Minn.
McCall, Cooper Holtzclaw, Johns Hopkins U., M.D. 1936, Rochester, Minn.
McCannel, Donald Archibald, Rush Med. Col., M.D. 1937, Rochester, Minn.
McCloud, Charles Naumann, U. of Minn., M.B. 1939, St. Paul
McGee, Horace Duane, Rush Med. Col., M.D. 1938, St. Paul, Minn.
McLoughlin, Christopher John, Hahnemann Med. Col., Phila., M.D. 1937, Rochester
Meyer, Wallace Martin, U. of Minn., M.B. 1939, Rochester
Miller, Harold Edmund, U. of Minn., M.D., 1937, Minneapolis
Miller, Harry Allen, U. of Minn., M.B. 1939, Fairmont, Minn.
Moir, William Wilmerding, Jr., U. of Minn., M.B. 1938, M.D. 1939, Minneapolis
Murray, Robert Alexander, U. of Minn., M.B. 1939, Minneapolis
Naegeli, Frank De Lee, U. of Minn., M.B. 1936, M.D. 1937, Minneapolis
Nickel, Walter Russell, U. of Minn., M.B. 1937, M.D. 1938, Rochester, Minn.
O'Donnell, Joseph Edmond, Northwestern, M.B. 1933, M.D. 1934, Rochester, Minn.
Ostergren, Eva-Jane, U. of Minn., M.B. 1938, St. Paul
Perry, Thorton Tayloe III, U. of Virginia, M.D. 1937, Rochester
Peterson, Osler Luther, U. of Minn., M.B. 1938, Minneapolis
Plimpton, Nathan Cope, Jr., Rush Med. Col., M.D. 1937, Rochester, Minn.
Reader, Donald Richard, U. of Minn., M.B. 1938, Minneapolis
Richardson, Ralph Dennett, Harvard, M.D., 1935, Rochester, Minn.
Robb, Charles Stuart, U. of Minn., M.B. 1939, Duluth, Minn.
Rogers, Robert Gifford, U. of Minn., M.B. 1939, Minneapolis
Roth, George Clark, Northwestern, M.B. 1937, M.D. 1938, St. Paul
Sax, Milton Herbert, Rush Med. Col., M.D. 1937, Eveleth, Minn.
Schroeckenstein, Hugo Franz, U. of Minn., M.B. 1938, St. Paul
Smith, Larry Allen, Northwestern, M.B. 1938, St. Paul
Sorem, Milton B., U. of Minn., M.B. 1938, St. Paul
Sullivan, Arthur William, U. of Ore., M.D. 1938, St. Paul
Sutton, Edmund Benedict, U. of Vermont, M.D. 1937, Rochester
Tischer, E. Paul, Indiana Univ., M.D. 1937, Rochester
Twyman, Richard Allen, Northwestern U., M.B. 1937, M.D. 1938, Rochester, Minn.
Vanderhoof, Edward Spaulding, U. of Minn., M.B., 1939, Minneapolis
Vinje, Edmund Gordon, Northwestern, M.B. 1938, St. Paul
Walsh, William Thomas, U. of Minn., M.B. 1938, Minneapolis
Wiig, Laurence Maxon, U. of Pa., M.D. 1933, Rochester, Minn.
Wold, Lester Eugene, Rush Med. Col., M.D. 1938, St. Paul
Youel, Milo Ashbel, U. of Minn., M.B. 1939, Lake Park, Minn.

By Reciprocity

Cunningham, Charles Barnard, U. of Mich., M.D. 1934, Virginia, Minn.
Kibler, John Martin, Johns Hopkins U., M.D. 1935, Rochester, Minn.
Skarshaug, Harvey James, U. of Iowa, M.D. 1926, Spring Valley, Minn.
Sorum, Frithjof Thorvald, Rush Med. Col., M.D. 1934, Jasper, Minn.

National Board Credentials

Barrett, Richard Henry, U. of Vermont, M.D. 1937, Rochester, Minn.
Pennington, Robert Edward, U. of Pa., M.D. 1936, Rochester, Minn.

In Memoriam

Charles Horace Mayo

1865-1939

CHARLES H. MAYO, well known not only locally but throughout the world as the younger of the Mayo Brothers of Rochester, Minnesota, died of pneumonia at Mercy Hospital in Chicago, May 26, 1939, at the age of seventy-three.

Dr. Charles H. Mayo

Born in Rochester, Minnesota, July 19, 1865, the son of William Worrell Mayo and Louise Wright Mayo and younger by four years than his brother, William J., Charlie, as he was known as a boy and to his more intimate acquaintances throughout his life, attended local grade and high school. After attending Niles Academy, he obtained his medical degree from Chicago Medical College, later known as Northwestern University, in 1888. He spent the next year at the New York Polyclinic and the following year in the New York Post Graduate Medical School.

Returning to Rochester he joined his father and brother in practice and soon established a group known as the Mayo Clinic. Dr. Charlie specialized in surgery of the head and neck and made early contributions to goiter and brain surgery. The tornado which hit Rochester in 1883 is said to have led to the building of Saint Mary's Hospital in that year by the Catholic Order of Saint Francis in a plot of twenty acres donated by Dr. W. W. Mayo.

Soon after beginning practice Dr. Charlie published his first medical paper, one written with his brother, which appeared in the *Northwestern Lancet* of November, 1891. Since that time scarcely a year has passed without a contribution on some phase of medicine or, as in later years the fields of philosophy, economics and statesmanship.

The recognition of his ability and attainments in the way of awards, degrees, titles, active and honorary positions, are too numerous to list here. They include a distinguished service medal from the United States government; designation as an officer of the national legion of honor of France, and Cross of Knight Commander of the Royal Order of the Crown of Italy.

Always active in medical organizations, Dr. Charles H. Mayo, was president of the Western Surgical Association in 1904, the Minnesota State Medical Association in 1905, the Society of Clinical Surgery in 1911, the Clinical Congress of Surgeons of North America in 1914, the American Medical Association in 1916, the American College of Surgeons in 1924, the American Surgical Association in 1931 and the Minnesota Public Health Association from 1932 to 1936.

A long list of honorary degrees conferred upon him include the Master of Arts degree conferred by Northwestern University in 1904, fellowship in the Royal College of Surgeons in England in 1920 and in the Royal Society of Medicine in 1926, master in chirurgy by Trinity College of Dublin in 1925. He was made Doctor of Science by the University of Leeds, England, in 1909, Doctor of Public Health by the Detroit College of Medicine and Surgery in 1927, Doctor of Science by Princeton University in 1917 and the University of Pennsylvania in 1925. He also received the honorary degree of LL.D. from the University of Maryland in 1909, Kenyon College in 1916, Northwestern University in 1921, the University of Edinburgh in 1925, Queen's University (Belfast) in 1925, the University of Manchester (England) in 1929, Hamline University in 1930 and Carleton College in 1932.

During the World War Dr. Charlie alternated every six months with his brother Dr. Will between Rochester, where they conducted postgraduate medical courses, and Washington, where they served in the personnel department of the medical corps of the Army. Dr. Charles Mayo was commissioned Major in the medical corps, April 19, 1917; Colonel, June 15, 1918, and Brigadier General in the reserve, November 22, 1921.

In 1893, Dr. Charles Mayo married Edith Graham of Rochester, Minnesota. He is survived by his widow and the following five of their eight children: Dr. Charles W. Mayo, Dorothy, Mrs. Fred W. Rankin, and Mrs. George T. Frenhohn all of Rochester, and Mrs. John B. Hartzell of Detroit, Michigan. Another son, Dr. Joseph Mayo, was killed in an automobile accident in 1936.

Dr. Charles Mayo was one of the guiding geniuses that caused the development in Rochester of a world center for medical education and research in the space of one life time. He leaves behind him a monument to his industry and life philosophy, and his family has the satisfaction that in a large measure he attained his life purpose attested early in his career, of relieving the greatest possible amount of physical suffering.

Henry H. Helk

1879-1939

DR. HENRY H. HELK, Minneapolis, died suddenly of a heart attack at his home, March 16, 1939.

Henry H. Helk was born in Arkansas, Wisconsin, November 4, 1879. He came, when a small boy, with his family to reside in Minneapolis, where he attended public schools.

He received his medical degree from the University of Minnesota in 1902, having been the first president of the local chapter of the Phi Rho Sigma medical fraternity.

After serving his internship at St. Joseph's Hospital, St. Paul, Minnesota, in 1902-1903, he practiced medicine for six months in Buttte, Montana. He also served as railroad surgeon for the Great Northern Railroad during that time. After that he located in Minneapolis, where he practiced continually until his death.

During the time Dr. Helk practiced in Minneapolis he was on the staff at St. Barnabas Hospital, being chief of staff about eight years previous to the time of his death.

He was a member of the Automobile Club of Minneapolis, a former member of the Elks' Lodge, and was the examining physician for the Elks' Lodge for many years. He was a member of the Hennepin County Medical Society, the Minnesota State Medical and the American Medical Associations.

Dr. Helk had a host of friends among members of the medical profession and was called upon to act as toastmaster on many medical occasions.

McClelland Shellman

1909-1939

DR. McCLELLAND SHELLMAN, who died after a nine-day illness in New York City on May 6, 1939, was born in Nashwauk, Minnesota, on January 1, 1909, the son of Dr. and Mrs. John L. Shellman, St. Paul, and grandson of Dr. Edward Dann, a pioneer physician and surgeon of southwestern Minnesota. He is survived by his widow and infant son, McClelland, Jr.

He spent his boyhood in St. Paul and graduated from the Central High School in 1926. Active in athletics, he was captain of the Central High School baseball team and was chosen "intercity star" in baseball.

After graduating from the high school, he entered the University of Minnesota Medical School, from which he was graduated in 1932 with a B.A. degree and in 1933 with an M.D. degree. While at the University he served as his class president and medical school representative on the University Student Council; he was a member of the Incus, honorary medical society; Phi Gamma Delta Fraternity and Nu Sigma Nu Medical Fraternity.

He served one year as house physician at the Milwaukee County Hospital. He practiced a few months in Nashwauk, Minnesota, and then returned to Milwaukee for a special nine months' course in pathology of the eye. Upon its completion, he entered the Billings Eye Hospital of the University of Chicago, for special training in ophthalmology, where he studied for three years. He was then appointed instructor in eye surgery, the youngest Billings trained graduate to serve in that capacity.

In February, 1938, Dr. Shellman moved to New York City and became associated with Dr. R. Townsley Paton, with offices at 927 Park Ave., New York City, in the practice of ophthalmology. He also was on the staff of the Manhattan Eye Hospital and Post Graduate School as lecturer and surgeon. He was a lecturer for the Society for the Prevention of Blindness at Rockefeller Center; lecturer on Perimetry and Color Blindness at the New York University Medical School and at the Columbia University Medical School.

Dr. Shellman was an earnest student and indefatigable worker. He became a skilled eye surgeon for a man so young in years. "Doctor Mac," as he was popularly known, left a proud record of service in his chosen specialty of ophthalmology.

Elmer C. Hanson

1896-1939

DR. ELMER HANSON, formerly of Park Rapids, but since last September a resident of Austin, died suddenly in his office of a heart attack on June 23, 1939, at the age of forty-two. He was a member of the Methodist Church. He was also a member of the Mower County Medical Society, the Minnesota State and American Medical Associations. Although a resident of Austin but a short time he was held in high regard by the many friends he had made. His wife and daughter, Betty, survive.

SULFAPYRIDINE

After careful study, the U. S. Food and Drug Administration has granted the right to manufacturers to distribute sulfapyridine in interstate commerce under the stipulations of the act dealing with new drugs. During the period when sulfapyridine was under consideration, *The Journal* and the Council on Pharmacy and Chemistry made every effort to obtain essential information concerning its usefulness in the treatment of various types of pneumonia and, in so doing, has consulted approximately 100 physicians who have replied to inquiry giving the details of their experiences with the drug. The replies received indicate that it is essential whereever possible to type each case of pneumonia before this drug is administered, because it has been reported by a number of investigators that there are cases of pneumonia which do not respond to this drug and have subsequently responded to the specific antiserums. It remains to be determined just how effective it is and just how well it will compare with antiserum in various epidemics over a course of years in various types of pneumococcic infections. The Council on Pharmacy and Chemistry has voted to accept sulfapyridine for inclusion in New and Nonofficial Remedies (*The Journal,* May 6, 1939, p. 1831) and to proceed with the consideration of the submitted brands of the drug. (J.A.M.A., May 6, 1939, p. 1830.)

REPORTS and ANNOUNCEMENTS

MEDICAL BROADCAST FOR JULY

The Minnesota State Medical Association Morning Health Service.

The Minnesota State Medical Association broadcasts weekly at 11:00 o'clock every Saturday morning over Station WCCO, Minneapolis (810 kilocycles or 370.2 meters) and Station WLB, University of Minnesota (760 kilocycles or 395 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota. The program for the month will be as follows:

July 1—Drowning
July 8—Postgraduate Medical and Hospital Education
July 15—Hot Weather Health Hints
July 22—Poison Ivy
July 29—Oral Hygiene

TWELFTH GRADUATE FORTNIGHT OF THE NEW YORK ACADEMY OF MEDICINE

The Twelfth Graduate Fortnight of the New York Academy of Medicine will be held October 23 to November 3, 1939. Clinics will be held each afternoon at fifteen of the leading hospitals of New York and each evening will be devoted to addresses by leading endocrinologists from throughout the country. Names which appear on the evening program include Herbert M. Evans, J. B. Collip, Elmer L. Sevringhaus, David Marine, Frank H. Lahey, Walter B. Cannon, Robert F. Loeb, Hugh H. Young, R. T. Woodyatt, J. F. Fulton, William G. MacCallum, Carl R. Moore. Morning conferences are tentatively planned and a comprehensive scientific exhibit will be on display. A registration fee of $5.00 will be charged. A complete program may be obtained by writing The New York Academy of Medicine, 2 East 103 Street, New York City.

BIOLOGICAL PHOTOGRAPHIC ASSOCIATION

The ninth annual convention of the Biological Photographic Association will be held September 14 to 16, 1939, at the Mellon Institute for Industrial Research, Pittsburgh, Pennsylvania. The program will be of interest to scientific photographers, scientists who use photography as an aid in their work, teachers in the biological fields, technical experts and serious amateurs. It will include discussions of motion picture and still photography, photomicrography, color and monochrome films, processing, et cetera, all in the field of scientific illustrating.

Further information about the Association and the convention may be obtained by writing the Secretary of the Biological Photographic Association, University Office, Magee Hospital, Pittsburgh, Pennsylvania.

STATE MEETING

The Eighty-sixth Annual Meeting of the Minnesota State Medical Association closed its three-day session, June 2, at the Minneapolis Auditorium with a registration of 4,339 persons, of whom 2,081 were physicians and a unique record of contribution to many fields of medicine and the public health.

In addition to a distinguished scientific program this meeting provided a successful and significant conference on the social and economic problems of medicine and also a new venture into the field of public health education which took the form of a public health exposition. The health exposition was held in the Auditorium, also, with the assistance of all the official and volunteer health agencies and it was open to the public for four days, ending Saturday, June 3.

The meeting in its entirety served as an interesting index of the current problems and preoccupations of medical men in Minnesota.

Fractures bulked large in the scientific program as they do in the practice of most physicians particularly in rural communities. The fracture demonstration of Wednesday, and the subsequent luncheon, dinner and evening meeting, addressed by Dr. C. L. Scudder of Boston, proved to be a popular feature of the meeting. Likewise, the twenty round-table luncheons demonstrated their appeal and will undoubtedly be incorporated in the convention schedule wherever facilities are available for them.

No review of the eventful three days would be complete, either, without mention of the banquet which, under the chairmanship of Dr. Gilbert Thomas of Minneapolis, was probably more thoroughly enjoyed than any other in the history of the Association. Tables were set up in the meeting hall and entertainment which included a twenty-eight piece orchestra from members of the Minneapolis Symphony Orchestra together with singing and dancing was given on the stage. The dinner took the form of a smorgasbord in place of the traditional banquet, and the only talk was a fine address by Governor Harold E. Stassen. Special thanks are due to Dr. Thomas, Chairman, and the Hennepin County Medical Society as hosts for the occasion.

The 1939 medal winner for the best individual scientific exhibit was Dr. Vernon L. Hart of Minneapolis for his exhibition on fracture problems. The medal is the annual gift of the Southern Minnesota Medical Association.

Proceedings of the House of Delegates and Council are briefly reviewed elsewhere in this issue and will be published in full in an early issue of the journal.

The officers elected for the new year are as follows: B. S. Adams, Hibbing, president-elect, to take office January 1, 1940; Carl M. Johnson of Dawson, first vice president; A. E. Cardle of Minneapolis, second vice president; B. B. Souster, St. Paul, re-elected secretary; W. H. Condit, Minneapolis, re-elected treasurer; W. W. Will, Bertha, re-elected speaker of the House of Delegates; E. A. Meyerding, St. Paul, re-elected vice speaker; A. E. Sohmer, Mankato, elected to take the place of Dr. Holbrook as Councilor of the Fourth District, who retired this year; C. A. Stewart, Minneapolis, re-elected Councilor of the Sixth District; W. L. Burnap, Fergus Falls, re-elected Councilor of the Eighth District; and F. J. Elias, Duluth, elected to take the place left vacant by Dr. Adams as Councilor of the Ninth District. F. J. Savage, St. Paul, was elected Delegate to the American Medical Association, and J. M. Hayes, Minneapolis, alternate.

Rochester is the meeting place selected for 1940. Meeting headquarters will be at the new Rochester Auditorium. The dates will be chosen later by the Council.

EAST CENTRAL MINNESOTA SOCIETY

The East Central Minnesota Medical Society held its spring meeting at Pokegama Sanatorium at Pine City, on Thursday, May 25. Elected to membership were Dr. Gordon Tesch, Elk River; Dr. Robert Leighton, Rush City; Dr. Richard Whitney, Cambridge; Dr. J. Y. Feinstein, Cambridge; Dr. Frank Mork, Anoka, and Dr. B. W. Bunker, Anoka.

A new constitution was adopted.

Dinner was served and a scientific program was presented by guest speakers. Dr. Edward Evans, Minneapolis, spoke on "Foot Conditions," and Dr. James Kerr Anderson, Minneapolis, demonstrated, with slides, a talk on "Hemorrhoidectomy; Indications and Technic."

WOMEN'S AUXILIARY

Mrs. A. C. Baker, Fergus Falls, *President*
Mrs. E. V. Glotz, 2259 Summit Avenue, Saint Paul, *Publicity Chairman*

A MOST successful annual meeting of the Women's Auxiliary of the Minnesota State Medical Association was held May 31, June 1, 2, and 3, in Minneapolis with a very good attendance. Just before the convention, the state president, Mrs. Wm. B. Roberts of Minneapolis, was called East by the illness of a close relative and was unable to preside at the meetings. It was a keen disappointment not only for her but for the members as well, who missed her graciousness and cordial personality. Mrs. John James Ryan of Saint Paul, second vice president, presided in the absence of Mrs. Malcolm Gillespie of Duluth, who was unable to attend.

The convention opened with registration Wednesday morning, May 31, at 8 A. M. at the Curtis Hotel. An Executive Board meeting was held at 10:30 A. M. at the Leamington Hotel and was followed by luncheon. The Women's Auxiliary of the Hennepin County Medical Association entertained all visiting doctors' wives at a delightful tea which was held that afternoon at 3:30 in the Hennepin County Medical Society Rooms, Medical Arts Building. The state officers were the honored guests. In the evening from 7 to 11 o'clock the Public Health Exposition was held in the Minneapolis Auditorium. Thursday, June 1, the annual meeting was held at Interlachen Country Club at 10:00 A. M. Mrs. R. R. Cranmer, retiring president of the Hennepin County Auxiliary, gave a very cordial welcome, to which Mrs. R. H. Wilson of Winona responded. The Memorial Service was conducted by Mrs. C. F. Ewing of Wheaton. Reports from the officers and various county presidents were followed by the election of officers.

Newly elected officers include Mrs. A. C. Baker, Fergus Falls, president; Mrs. M. A. Nicholson, Duluth, president-elect; Mrs. John James Ryan, St. Paul, first vice president; Mrs. B. A. Robertson, Austin, third vice president; Mrs. T. N. Flemming, St. Cloud, second vice president; Mrs. R. J. Josewski, Stillwater, Minnesota, recording secretary; Mrs. N. H. Baker, Fergus Falls, corresponding secretary; Mrs. R. R. Noice, Minneapolis, treasurer; Mrs. W. W. Moir, Minneapolis, auditor; Mrs. E. C. Eshelby, St. Paul, parliamentarian; Mrs. J. B. Gaida, St. Cloud, historian. The new advisory committee includes Mrs. J. F. Norman, Crookston; Mrs. E. M. Hammes, St. Paul; Mrs. O. O. Larsen, Detroit Lakes. Luncheon followed at the club with Dr. F. W. Jackson of Winnipeg as guest speaker, who gave a splendid talk on "Motherhood and Medicine." Dr. Jackson is Deputy Minister of Health and Public Welfare of Manitoba. Mrs. F. J. Elias of Duluth presented Mrs. A. C. Baker with the President's Pin, and Mrs. Baker responded with greetings.

A post-convention board meeting followed the luncheon with Mrs. Baker, presiding. The new committee chairmen were announced and include: Organization, Mrs. M. A. Nicholson, Duluth; Finance, Mrs. James Blake, Hopkins; Legislation, Mrs. L. L. Sogge, Windom; Public Relations, Mrs. A. F. Branton, Willmar; Hygeia, Mrs. W. W. Will, Bertha; Health Education, Mrs. J. A. Thabes, Sr., Brainerd; Press and Publicity, Mrs. E. V. Goltz, St. Paul; Printing, Mrs. R. R. Cranmer, Minneapolis; Exhibits, Mrs. M. S. Henderson, Rochester; Resolutions, Mrs. Charles Colstra, Ortonville; Archives, Mrs. S. S. Hesselgrave, St. Paul. The Social Committee for the year will include Mrs. B. F. Davis, Duluth; Mrs. C. C. Chatterton, St. Paul; Mrs. Martin Nordland, Minneapolis.

A most enjoyable banquet was held that night at 7:00 P. M. with Dr. George Earl, president of the Minnesota State Medical Association, as toastmaster; Mrs. A. C. Baker, the new president of the Auxiliary, was introduced and gave a splendid talk.

Friday, June 2, visitors were taken to the Sibley house at Mendota for luncheon and a tour of the historic buildings there.

Members of the Hennepin County Auxiliary proved perfect hostesses, and everything was done to insure a delightful time for those attending the meetings.

Minnesota is favored in having two members on the National Board this coming year. Mrs. James Blake of Hopkins was reëlected Chairman of Finance, and Mrs. John J. Ryan of St. Paul was appointed historian.

PROCEEDINGS of the MINNESOTA ACADEMY OF MEDICINE

Meeting of April 12, 1939

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, April 12, 1939. Dinner was served at seven o'clock and the meeting was called to order at eight o'clock by the president, Dr. Carl B. Drake.

There were forty-two members present.

Minutes of the March meeting were read and approved. The proposed amendments to Article III, Section 1, and Article III, Section 2, which has been proposed at the March meeting and published in the bulletin for the April meeting were voted upon and carried.

The scientific program was as follows:

EARLY CANCER OF THE LARYNX

Kenneth A. Phelps, M.D.
Minneapolis

Early diagnosis is generally conceded to be the keynote of the control and cure of cancer, regardless of its location. The diagnosis of early cancer is much more complicated than that of the advanced disease, because it is possible to examine a lesion in such an early stage that there may be some question of its being neoplastic. This is becoming recognized as the public comes earlier for examination.[2]

For years, cancer of the larynx has been classified as extrinsic or intrinsic. This has resulted in some confusion as to whether the classification was based on anatomical or clinical grounds. We need no such classification for the purpose of this discussion. In making the diagnosis, "cancer of the larynx," the important thing is to establish the precise point of origin of the disease. There are four locations to consider: (1) the vestibule (the free border and the laryngeal surface of the epiglottis and the ventricular bands); (2) the ventricle; (3) the vocal cords; (4) the subglottic area. Cancers originating in these four areas differ in their symptomatology, extension (local or general), therapy and prognosis.

The histology of the larynx has an important bearing upon the growth, lymphatic involvement and radiosensitivity of epitheliomas, which may arise from its mucous membrane. The larynx is located where the air and food passages cross. Embryologically, the portion of the larynx above the vocal cords arises from the floor of the pharynx; while the vocal cords and below are a part of the original pulmonary outgrowth from the esophagus (foregut).

The epithelium of the upper respiratory tract is of the cylindric form, that of the upper digestive tract is of the squamous type. As the individual grows older, these types change where the two tracts come together. At birth, cylindric epithelium lines the larynx, except for the edge of the vocal cords. Due to normal metaplasia, these cells gradually become pavement in type and eventually cover the epiglottis, aryepiglottic folds, vocal cords, and, at times, the ventricular bands; though here a few foci of cylindric epithelium usually persist. Below the cords the pavement epithelium gradually merges into the cylindric, ciliated epithelium of the trachea.

Epitheliomas arising above the vocal cords are made up of cells which tend to be of less hornifying type and are more radiosensitive. Those from the cords and subglottic area are more differentiated, and call for surgical rather than radiation therapy.

The exact cause of cancer is not known, but certain predisposing causes, called by Dr. Jackson[5] "precancerous lesions," have been considered by him to have an etiological bearing. Jackson believes the causative factor in about 65 per cent of cases is vocal abuse which is responsible for chronic laryngitis, keratosis and granuloma. He cites the therapeutic value of vocal rest in these conditions. He considers chronic laryngitis, keratosis, granuloma, papilloma, leukoplakia, chronic irritation, and benign tumor as precancerous lesions. Sir St. Clair Thomson[13] in his book says there is no proof that these conditions are precancerous lesions and he also excludes lues, chronic irritation, heredity, excessive use of alcohol or tobacco. He challenges Jackson's contentions thus: "If vocal abuse were a predisposing factor cancer of the larynx would occur more often. The fact that cancer is ten times more frequent in men than women lends no support to his contention." He does not believe in precancerous lesions, and states cancer rarely follows benign tumors. Nevertheless, it seems generally agreed that long continued irritation plays a role in the genesis of malignant tumors. The histological features of precancerous lesions will be discussed later.

Just why cancer of the larynx so rarely occurs in females is not known. However, cancer in women commonly affects the uterus or breasts and perhaps this predilection is a factor of safety to the female larynx, (E. T. Bell).

Hoarseness is the most important early symptom of cancer of the larynx. Any patient whose hoarseness has persisted for three or four weeks is entitled to a complete history and physical examination. The more frequently such complete histories and physical examinations are made, the more frequently will early cancer be diagnosed and cured.

In taking the history of our patient we should inquire into his vocal habits, his previous laryngeal diseases, his working and living conditions, use of tobacco and alcohol and the presence of cough, earache, and dysphagia.

The examination should include: (1) a thorough laryngeal examination, externally by inspection, palpation and x-ray, and internally by direct and indirect methods; (2) a bronchoscopic and esophagoscopic examinations, as lesions discovered by these means may be related to the hoarseness; (3) a careful dental and oral survey; (4) a check up on the nose, nasopharynx, and nasal sinuses; (5) x-ray of the chest; (6) complete blood tests, both cytologic and serologic; (7) biopsy for completeness.

The specimen for biopsy can best be obtained by using a small biting punch, smaller even than the usual operating laryngeal punch. If the lesion is very small, it is better to remove it entirely, but this occurs very rarely in the larynx.

It seems wise to make biopsy a routine procedure, even though the experienced laryngologist quite often is able to make the diagnosis without it.

No natural barrier can be broken down by taking a biopsy specimen from a laryngeal cancer, as it is not encapsulated. Neither is it necessary to cut through normal tissue in order to obtain it. Experience of numerous observers has clearly shown that taking a specimen for biopsy is not dangerous and does not spread the cancer, either locally or generally. Nevertheless, we know that incomplete operation stimulates the growth, so it is just as well to proceed with the therapy as soon after biopsy as possible. The biopsy can be done at the time of operation if it seems advisable.

The specimen for biopsy may be taken by direct or indirect means, but it must be from the proper site and be of sufficient depth. Repeated biopsies may be necessary as in Case 1, or the biopsy may be positive for cancer and when the cord is removed no cancer is present, as in Case 8. (The biopsy removed the cancer). This is not to be taken as an argument in favor of the intralaryngeal method of removing a cancer from the vocal cord.

Cancer can now be produced experimentally in the laboratory and observations can be made on the changes occurring in the epithelium as it becomes malignant. Just the exact moment when cancer is said to be definitely present, is a matter for the individual pathologist to decide. He bases his opinion upon the extent of epithelial invasion. In other words, it may be difficult for the pathologist to say whether a lesion is precancerous or malignant.

The clinician would do well to realize that cancer is the final end-result of a series of changes and does not suddenly or accidentally appear in previously normal tissue. As Cutler[2] so well puts it: "Before the epithelial cells have actually transgressed normal boundaries they may present all the morphologic appearances of cancer, and biopsy may encounter these epithelial changes during any stage of their progress from benign hyperplasia to malignant neoplasia confined within normal boundaries, and finally to actual invasion of outside tissues. All malignant tumors do not start as malignant tumors and all benign tumors do not stay benign." Right here I must acknowledge my constant use of Cutler and Buschke's book[2] in the preparation of this paper. In my opinion, it is the finest thing in print on the subject.

All pathologists are not agreed that they can determine the degree of malignancy from a biopsy according to Broders classification. In typical cases, very low or very high degree of malignancy, it is generally agreed that there is a relationship between the clinical and microscopic pictures. The value of the pathological interpretation depends upon the competency of the pathologist, and in any event his interpretation should be related to the clinical findings. Often the location of the lesion is as valuable as the microscopic grading, in determining the degree of malignancy. Another valuable aid is the comparison of the size of the growth to its duration. When the history and clinical course point definitely to cancer, and the biopsy findings are negative, the lesion should be treated as malignant.

Pathologists are also not agreed that they can predict the degree of radiosensitivity from a biopsy. Harris and Klemperer,[3] working on cancer of the larynx, concluded that the biopsy gave no hint as to radiosensitivity. Here again the clinical features are the best guides. The site is important—a false cord tumor is more likely to be radiosensitive than one on the true cord. Papillary tumors are more radiocurable than infiltrating ones. The microscopic information is of value only when used in conjunction with the clinical findings.

Cancer of the Vestibule

1. Free border of the epiglottis and its laryngeal surface. Early cancer in this location is painless and metastasizes rapidly. It occurs in two main varieties.

a. *Ulcerated.*—Usually, when first seen, this tumor is quite large and there are large lymph nodes present in the neck at the level of the hyoid and beneath the sterno-mastoid muscle. The growth quickly extends through the epiglottis anteriorly, and a mass can be seen and felt between the hyoid and the thyroid cartilages. This may be what brings the patient for examination, and the diagnosis may be missed unless a laryngoscopic examination is made.

b. *Non-ulcerating.*—The smooth mass may act similarly to the ulcerating one, that is, may extend through the epiglottis and produce early adenopathy. In both of these tumors the extension anteriorly can not be told by laryngoscopy, but a good x-ray film will frequently reveal it.

A third type should perhaps be mentioned, since it arises from the tip of the epiglottis. This tumor extends anteriorly to the valeculæ or to the pharyngeal wall and is not a true laryngeal tumor. It responds well to electro-coagulation.

2. *False cord tumor* may be papillary or ulcerating in type. Its most common site is at the junction of the epiglottis and the false cord. Occasionally it starts submucously. Cancer at this site is characterized by early spread to the opposite side, across the base of the epiglottis, as well as through the epiglottis anteriorly. It spreads upward rather than downward due to the lymphatic flow. The ventricular cavity and true cord usually remain free from involvement. Large cervical nodes appear early at the posterior margin of the hyoid bone—similar to those from cancer of the epiglottis. The tumor grows toward the midline and produces early dyspnea. Ulceration and bleeding occur early. Pain in the ear is frequent.

When the growth does impinge on the true cord, hoarseness appears. The voice is lower pitched and the change is intermittent, which distinguishes it from the continuous hoarseness due to cancer of the true vocal cord.

Vestibular tumors eventually affect both the epiglottis and the ventricular band, regardless of its actual site of origin. They grow rapidly and spread widely and so are usually inoperable when first seen. The treatment of choice is radiotherapy and fortunately the response is good. Even large tumors, with extensive bilateral metastases, do well, as they are made up of radiosensitive cells. In fact, this group makes up most of the successes of radiation therapy in laryngeal cancer.

Cancer of the Ventricle

Cancer of the ventricle is characterized in its early stages by invisibility and absence of symptoms. One may find tenderness on palpation of the thyroid cartilage or distortion in its shape when the growth extends externally. Interference with respiration may be the first symptom to appear when the lumen is invaded. Dysphagia occurs if the pyriform fossa is involved.

Mirror laryngoscopy may reveal an elevation of the ventricular band and perhaps the tumor may be seen coming from beneath. Direct examination will discover the tumor earlier than any other diagnostic procedure. It should be mentioned that no direct laryngoscopy is complete without an inspection of the ventricles.

Radiographs may disclose early invasion of the thyroid cartilage as shown by deformity, decalcification or destruction.

Lymphatic spread is upward rather than downward.

If an early diagnosis is made before cartilaginous invasion, radiation offers as good or a better prognosis than surgery, for these tumors tend to be radiosensitive. However, early invasion of the cartilage makes a cure by any therapeutic means very doubtful.

The ventricle is related to certain branchiogenic anomalies, and occasionally cancer develops in these. I have seen two such cases, both diagnosed at operation, and in both recovery took place.

Cancer of the Vocal Cord

Cancer of the vocal cord constitutes 90 per cent of laryngeal cancers. The symptoms are local discomfort and persistent hoarseness, which is constant and progressive, unlike the intermittent hoarseness of false cord lesions. The growth of early cancer of the vocal cord is slow and it remains superficial for some time. This is due to the scarcity of lymph vessels, as well as to the fact that they constitute their own network and do not freely anastomose with the neighboring lymphatics. The cord limits extension also, due to its being a fibro-muscular band. The most frequent site is the middle one-third and on the free border of the cord. It extends forward and downward, which makes it favorable for early and complete removal.

Cancer of the vocal cord usually occurs in men over the age of forty, but numerous cases of young people with this lesion are recorded, so it is either becoming more common or is being recognized earlier.

The differential diagnosis includes chronic laryngitis, benign tumor, keratosis, pachydermia, tuberculosis, lues and paralysis of the vocal cord. A careful study of the general condition of the patient together with observation, perhaps repeatedly, of the local lesion, including biopsy, makes the diagnosis of the early case quite positive.

The local appearance may be: (1) persistent thickening and congestion of the cord; (2) definite tumor, single, grey and warty in appearance, with irregular infiltration; (3) superficial ulceration of limited character; (4) carcinomatous membrane, which spreads along the surface without ulceration or invasion, which tends to extend anteriorly and go around the anterior commissure to the opposite cord; (5) papillary type, usually in a patient who has had benign papillomata previously and represents a malignant degeneration.

Pain is rare in the early stages, for pain is due to ulceration or invasion. Dyspnea is never an early symptom nor is dysphagia.

Fixation of the cord is important in respect to prognosis and diagnosis. Unilateral loss of mobility, when there is a lesion on the cord, is almost pathognomonic of cancer. Lues and tuberculosis may produce fixation, but rarely on one side only. One should consider the possibility of edema or secondary infection as the etiologic factor. In such cases, the motion returns rather early following radiation (Case 5). Fixation was formerly considered an early sign of cancer, but we now know it is a rather late sign, as it is generally due to infiltration of the musculature or to invasion of the arytenoid cartilage.

Treatment

In treating a case of early cancer of the vocal cord one must consider surgery or radiation. The surgeon and the radiologist should coöperate for the best interests of the patient. Both should examine the patient and decide together upon the proper treatment. The ideal result would be complete removal or destruction of the tumor without interfering with the vocal or respiratory functions.

Surgery.—1. Peroral approach is not recommended, as it is impossible to be sure of complete removal by this technic. However, there are a few isolated examples of a cancer having been successfully removed by means of the laryngoscope.[7, 13]

2. Laryngofissure is the operation of choice. It consists of splitting the thyroid cartilage and removing the diseased vocal cord in one piece with about fifteen millimeters of surrounding tissue. New[10] has found cancer cells may extend up to fifteen millimeters beyond the gross limits of the tumor. At times a portion of the thyroid cartilage is removed. The hyoid bone may be split for better exposure. Tracheotomy may be done. Diathermy applied to the area after excision helps control bleeding and also helps destroy the cancer cells. To prevent subcutaneous emphysema a small, split-rubber tube should be left in the lower part of the

CASES OF EARLY CANCER OF THE LARYNX

Name	Age	Duration of Hoarseness	Location of Lesion	Pain	Fixation of Cord	Date of Operation	Results	
							No Recurrence	Recurrence
1. Koch	52	7 months treated for sinusitis	Right middle ⅓	Slight dysphagia	1	7-25-29 No x-ray	Died P. M. 5-3-34 following goiter operation	
2. Nerhaugen	55	6 months	Right middle ⅓	0	0	No x-ray 1-20-31	Seen Oct. 1937 Voice good	
3. Just	72	3 months	Left middle ⅓ and ventricle	0	1	8-8-35 X-ray postoperatively		1937 X-ray
4. Zwight	69	2 months	Right middle ⅓	0	1	4-20-36 X-ray postoperatively	Voice good	
5. Berger	32	3 months	Entire right cord and subglottic	Otalgia	2	No operation x-ray 1936	Cords freely mobile Voice perfect	
6. Lordan	75	1 year	Left cord, large mass, tip of right cord	0	2	1-8-37	Died heart failure, 48 hours	Had carcinoma lip operation 20 years ago
7. Krauser	52	4 months	Left cord and tip of right	Otalgia	2	2-5-38 X-ray postoperatively		June, 1938, death
8. Fellows	52	7 months treated sinuses	Middle right cord	0	1	6-22-38 No x-ray	O.K. to date	
9. Knowlton	54	3 months	Left cord and ventricle	0	2	10-2-38 X-ray now		
10. Bruhn	71	2 months	Right cord, middle ⅓	0	2	10-28-38		

wound, up to the cartilage and beneath the skin, as advised by New.

When cases are properly selected, the operative mortality is very low. Cure is obtained in 85 per cent of the cases. Functional results are good, due to the replacement of the removed cord by a fibrous band. The one cause of disappointment is when this operation is done in borderline cases, such as extension of the cancer to the arytenoid cartilage, the subglottic region, ventricle or false cords.

Fixation of the cord is a contraindication to laryngofissure according to Crowe and Broyles,[1] MacKenty,[8] New,[10] and Hautant,[4] who quotes Gluek, Sorenson and Koehler. Thomson,[13] in 1922, considered fixation a contraindication to laryngofissure, but now has extended the operation to include cases with fixation as well as subglottic involvement. However, his own figures are as follows: unimpaired motility—84 per cent non-recurrence within three years; impaired motility—75 per cent non-recurrence within three years; complete fixation—44 per cent non-recurrence within three years.

If the lesion extends to the anterior commissure or to the opposite side, restricted surgery has less chance of a cure. Jackson[6] reports a method of excising such a lesion, if it is small, by making the incision through the larynx so as to avoid the midline. He reports 79 per cent free from recurrence in thirty-four patients. New also recommends this procedure if the grade is low. Crowe[1] and MacKenty[8] consider the involvement of the anterior commissure a contraindication to laryngofissure. The grade of the tumor, according to Jackson, is not a contraindication to laryngofissure, though New would do a laryngectomy if grade four were found.

Recurrences do not respond well to secondary operation. As MacKenty says, "We have one shot for a bull's-eye and if we miss, the patient pays with his life." Most authorities agree as to this except Tucker,[14] who states, "Recurrences following thyrotomy may be amenable to another thyrotomy and always to a total laryngectomy."

Radiotherapy.—In 1922, before the International Congress of Otology in Paris, Regard, Coutard, and Hautant reported the first successful result of roentgen therapy in laryngeal cancer. Six inoperable patients were treated and all were free from disease at that time. Sixteen years later three were still living (50 per cent). Coutard concentrated his research on the larynx, as it is readily accessible to observation and ray penetration, contains cartilage, joints, and a variety of mucous membranes. Thus, the larynx has contributed much to the knowledge of roentgen therapy in general.

The effects of external radiation, either x-ray or teleradium, are: (1) the devitalization of the tumor cell, and (2), the changes produced in the normal tissue. These latter are: edema, fibrosis, necrosis, alterations in mobility of the vocal cord, lowering of resistance to infection, and are the complications of radiation and limit its effect.

The technic varies with the extension, site and histology of the tumor. A long enough time must be taken to allow the normal tissue to recover, and still deliver a sufficient dose to the diseased tissue.

Radiosensitivity is a clinical term and is confusing in some respects. For example: A tumor may be radiosensitive and respond well to x-ray therapy, but if the tumor recurs it may be radioresistant and not respond well to x-ray therapy. Nevertheless, it is the fact that certain tumor cells are radiosensitive which makes it possible for radiation therapy to affect these cells and still leave the normal structures unharmed.

Radiologists know that the same tumor may vary in its radiosensitivity at different times. The variation is a decrease rather than an increase in sensitivity. When the blood supply to the tumor is altered by inadequate treatment (either surgery or x-ray) radioresistance develops. This explains why a second course of therapy is less successful than the first. It also means that if the best results are to be obtained, radiation should be used as a preoperative adjunct rather than postoperative. Postoperative radiation probably has little effect on metastases if the operation was complete, for these develop from distant foci already present.

X-ray treatment of the larynx is always accompanied by a skin reaction—not a burn—which usually clears up. The mucous membrane also develops a reaction which should appear at definite times in the different locations of the larynx. These changes are carefully watched by the expert radiologist during his therapy, as they form an excellent guide to the results he is obtaining.

Certain complications of x-ray therapy to the larynx frequently occur, such as pain on swallowing due to pharyngeal irritation; dryness of the mouth due to lack of salivary gland secretion; and edema of the glottis.

Good radiologists are getting better results now than formerly in treating early cancer of the vocal cord. An intense course of radiation therapy is a more formidable procedure than a simple laryngofissure and may be more trying for the patient. At present the results of ray therapy are so unpredictable that the radiologist is unable to assure the patient that the disease can be cured with the same degree of certainty that the surgeon can. Until the results are more consistent, radiation alone should not be depended upon.

If, however, the patient's general condition is such that his life is apt to be short, or if he refuses operation, radiation should be advised. If the tumor shows regression after 50 per cent of the total dose has been given, the treatment should be continued. If not, surgery should be advised, as the tissue will not be damaged enough to interfere with the operation.

The use of radium applied interstitially in early cancert of the larynx has not been successful, according to Cutler, but Negus[9] of London recently reports several patients treated by teleradium as well as the interstitial method with excellent results.

Ten case reports in outline are submitted.

Subglottic Cancer

Subglottic cancer is probably more frequent than has been realized. The increased use of x-ray as a diagnostic aid in diseases of the larynx will probably result in finding more of these cases. This lesion usually starts about one centimeter below the middle third of the vocal cord. The mucosa here is loosely attached and is covered by cylindrical epithelium. The tumor spreads below the mucous membrane and ulcerates late. When it invades the cord it affects its mobility. If the lesion is seen at this stage, a diagnosis is difficult, and it is hard to know if it started on the cord and extended below, or vice versa. The tumor may cross beneath the anterior commissure or go posteriorly to the cricoid. The cartilages are invaded early.

No clinical signs are present until the cord is affected or until the cartilage is invaded. Hoarseness and pain locally then occur. Lymph nodes may be palpable below the thyroid cartilage.

Taking a specimen for biopsy is difficult, because the tumor is below the mucosa and repeated attempts may not obtain a proper specimen to show the lesion.

This condition is never diagnosed in time to obtain a cure except by total laryngectomy. Radiation treatment is difficult because of early invasion of the cartilage.

Conclusions

Early cancer of the larynx varies in its prognosis, diagnosis, and treatment according to its point of origin, as follows:

1. Vestibule—early diagnosis rare, prognosis fair, radiation therapy indicated.

2. Ventricle—early diagnosis rare, prognosis fair, radiation therapy indicated.

3. Vocal cord—early diagnosis should be frequent, prognosis good, surgery indicated.

4. Subglottic—early diagnosis rare, prognosis poor, surgery indicated.

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CAVERNOUS ATROPHY OF THE OPTIC NERVE

Report of Four Cases

Hendrie W. Grant, M.D.
Saint Paul

Cavernous atrophy of the optic nerve is a comparatively rare disease causing contraction of the visual fields, loss of vision and cupping of the optic nerve, as in glaucoma, without any definite cause as yet assigned. Most likely to be confused with glaucoma simplex be-

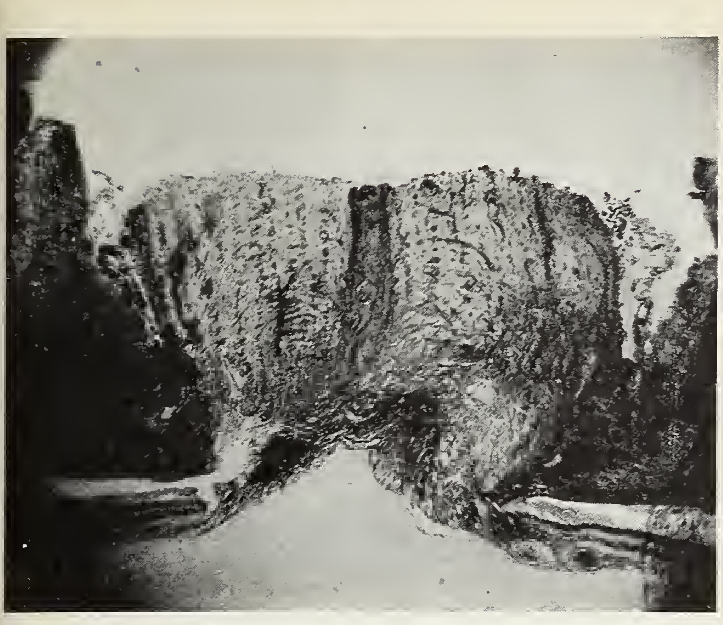

Fig. 1. Cavernous atrophy of the optic nerve in glaucoma. ×8.

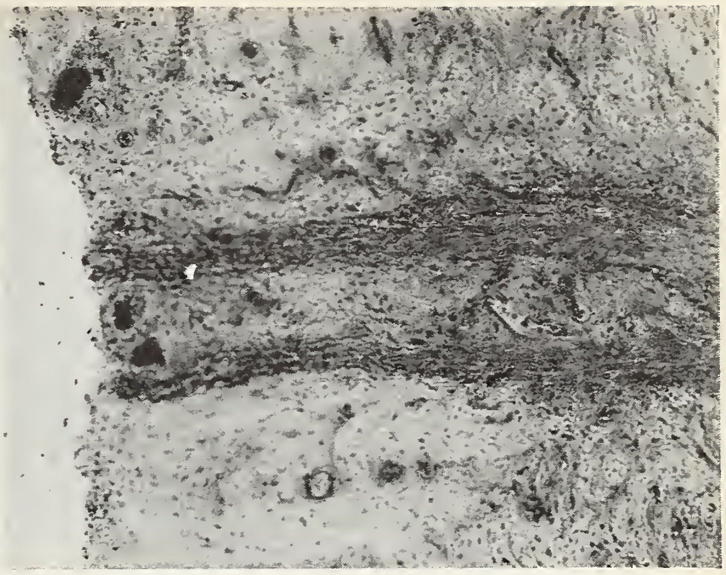

Fig. 2. Area of optic nerve. Note absence of glial tissue. ×75 (Fig. 1).

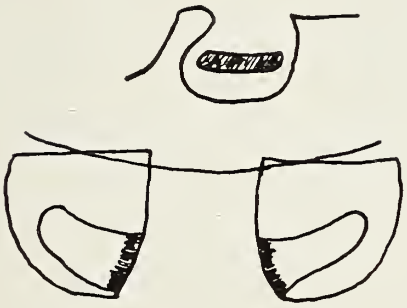

Fig. 3. Calcification of the internal carotid in the cavernous sinus and in the superior orbital fissure (after Knapp).

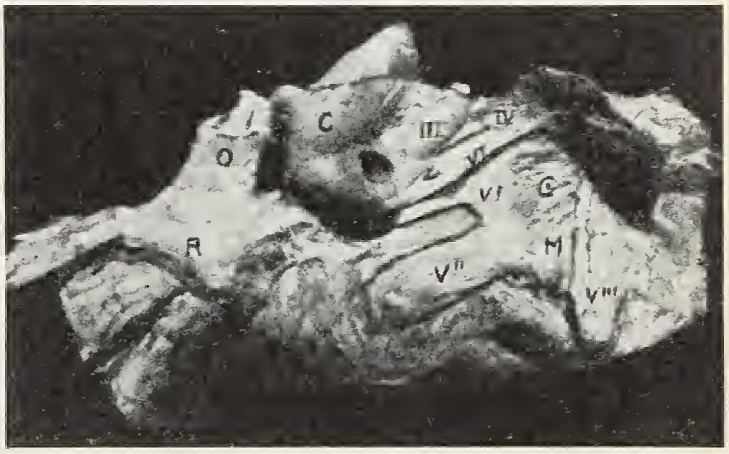

Fig. 4. Internal carotid and ophthalmic artery in cavernous sinus.

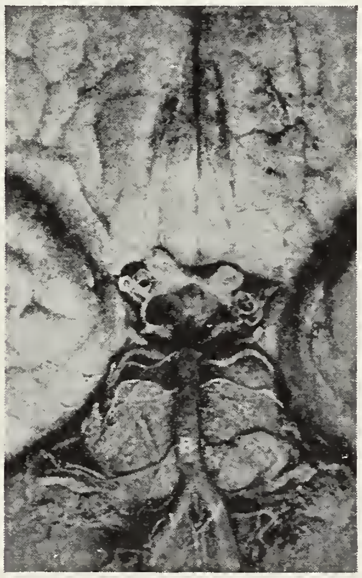

Fig. 5. Vessels at base of brain. Relation of internal carotid to optic chiasm.

cause of the marked cupping of the optic nerve, there are many signs lacking in the former disease.

Increased intraocular pressure is definitely absent and no abnormal rise is seen with the use of mydriatics such as homatropin. Cupping of the optic nerve may extend to the extreme periphery of the nerve, yet in some cases this cupping is not associated with pallor. The loss of vision is extremely slow and not as pronounced as the cupping would indicate. Affecting elderly individuals, only, it is frequently associated with arteriosclerosis but is by no means present in all or even a few individuals who present evidence of arteriosclerosis.

The ordinary measures which are used for the control of glaucoma not only fail to improve vision but may cause a decided reduction through decreased intraocular pressure.

The etiology of this condition is, as yet, unknown although several factors have been described. The anatomical changes in the anterior segment of the eyes, namely, glaucomatous panus, atrophy of the iris, ectopia of the iris pigment and closure of the iris angle are lacking. Recognized by Von Graafe as blindness with excavation of the optic nerve, only a few years later it was classified by Schmidt-Rimpler as glaucoma simplex without increased tension. Later Stock, Fuchs, Markbreiter and Orr reported similar cases, believing that an abnormally weak lamina cribosa caused the excavation without any marked rise in intraocular pressure. Elsching examined histologically one of these cases and found a quite normal anterior segment, a lamina cribosa in normal position and atrophy of the nerve with formations of caverns. Schnabel also

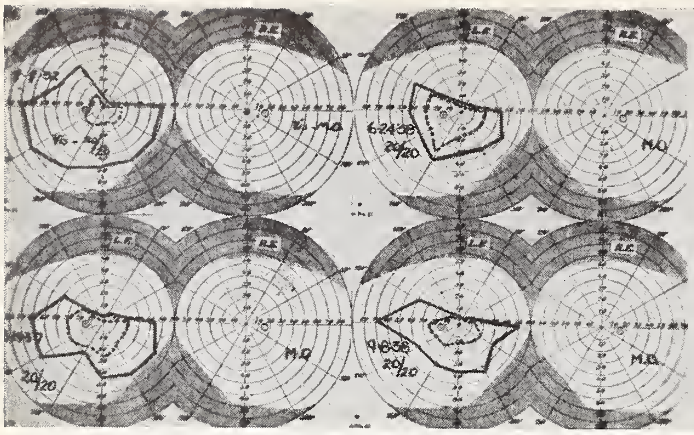

Fig. 6. Peripheral fields in Case 1.

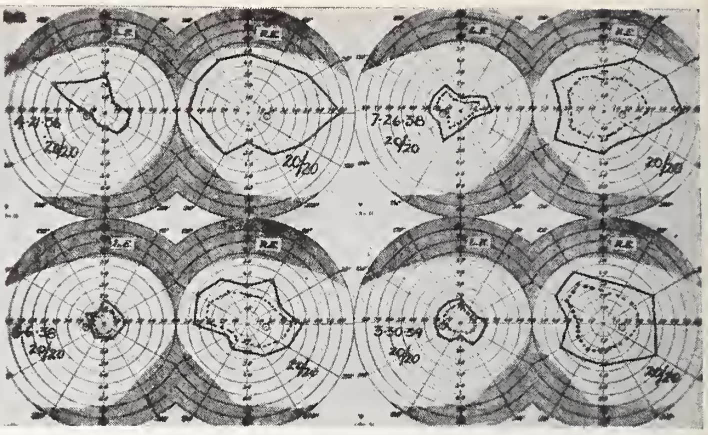

Fig. 7. Peripheral fields in Case 2.

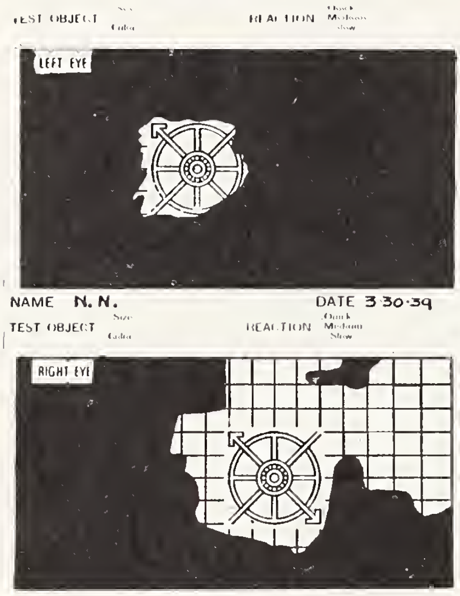

Fig. 8. Central fields in Case 2.

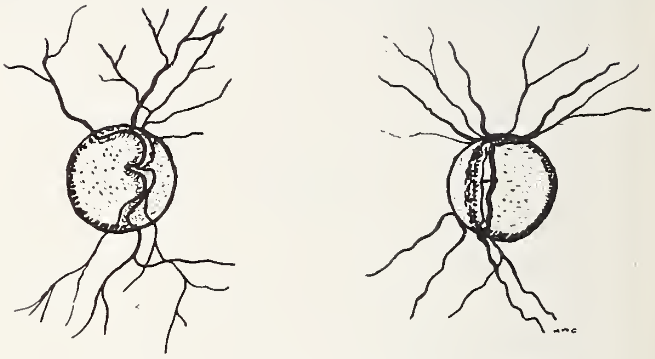

Fig. 9. Cupping of the optic nerve, Case 2.

found these same caverns in glaucoma, while others have reported their presence in high myopia. Unlike simple atrophy, these caverns are not replaced by neuroglia tissue, hence the cupping (Figs. 1 and 2).

Gradle made a review of the cases in 1917 and expressed the belief that the condition was a disease entity not explained by any theory previously given. He stresses the very low grade uveitis and neuritis found by Elsching, the lack of response to decreased intraocular pressure and the failure of all treatment, in support of his contentions. Knapp in 1932 again reviewed the published cases and reported ten cases he had seen in a four year period. He was of the belief that the cupping and atrophy was due to pressure of the sclerosed ophthalmic, carotid and anterior cerebral arteries and showed, roentgenographically, evidence of sclerosis in each of his cases. He also goes into detail concerning visual disturbances associated with arteriosclerosis recognized by Turck since 1852.

Herman Knapp, in 1875, described a case in which a calcerous internal carotid pressed on the lower and outer surface of the optic nerve and produced a nasal field defect (Fig. 3).

Otto in 1893, and Liebrecht in 1907, reported four and seven cases respectively of sclerosis of the internal carotid and ophthalmic arteries causing optic atrophy. Librecht described atrophy as due to pressure from (1) the ophthalmic artery in the fibrous optic canal; (2) the ascending internal carotid; (3) the internal carotid and the anterior cerebral artery as they come in contact with the optic chiasm. Arnold Knapp states, however, that most of the cases are autopsy reports and do not correlate clinical and anatomical findings. The x-ray pictures are extremely difficult to take and are often very disappointing. He also quotes Wilbrand and Saenger and Warburg, who believe that the changes in the optic nerve are due to trophic disturbances from sclerosis of the smaller vessels causing perivascular softening. Sosman, likewise, does not believe that the changes are due to calcification of the vessels (Figs. 4 and 5).

In addition to the four case reports, detailed field studies for central and peripheral fields are shown. Marked improvement in some cases follows therapy with liver extract and Vitamin B. The reason for improvement is not known.

In each case here reported, homatropin has been used on several occasions without any pathologic increase in tension or intraocular pressure. The central field changes and the cupping of the optic nerve are accurate reproductions.

Case 1.—H. F., aged seventy-seven, was first seen in 1932 complaining of loss of vision of the right eye which had failed quite rapidly several years ago. He thought that the vision had improved recently. Examination showed vision to be: right 20/20, left M. O.

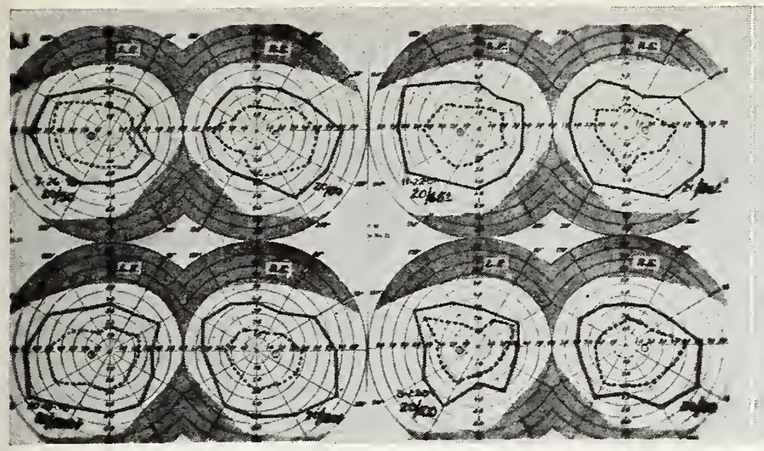

Fig. 10. Peripheral fields, Case 3.

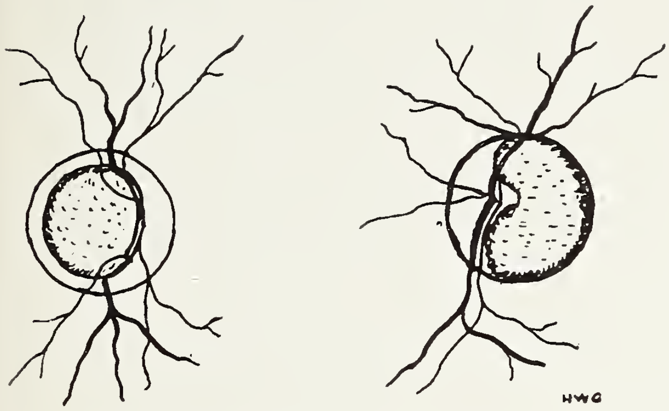

Fig. 11. Cupping of the optic nerve, Case 3.

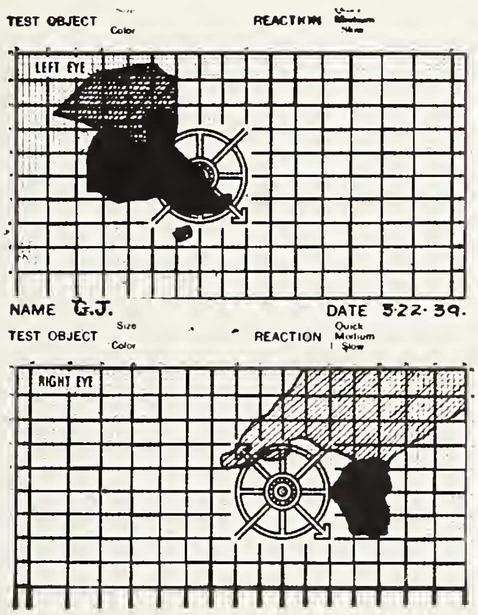
TEST OBJECT Size Color
REACTION Quick Medium Slow
LEFT EYE
NAME G.J.
DATE 5·22·39.
TEST OBJECT Size Color
REACTION Quick Medium Slow
RIGHT EYE

Fig. 12. Central fields, Case 3.

External structures were normal. Tension: right 24 mm., left 20 mm. The fundi showed marked cupping of each optic nerve which, in the right eye, was extreme. There was no marked reduction of pressure with the use of pilocarpine. During the past seven years frequent examinations have shown no change in the tension, a fairly well preserved field and normal vision in the left eye. In June 1938 he was given liver therapy and Vitamin B with marked improvement in the general symptoms and perhaps some improvement in his visual field (Fig. 6).

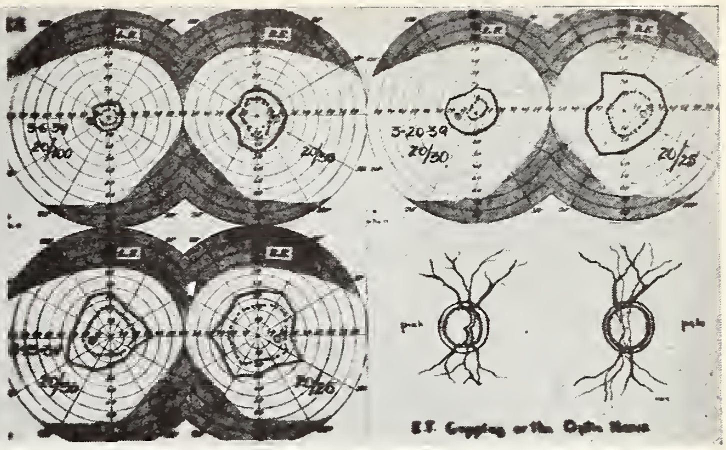
5-6-39
20/100
5-20-39
20/30
20/25
20/120
E.T. Cupping of the Optic Nerve

Fig. 13. Peripheral fields and cupping of the optic nerve, Case 4.

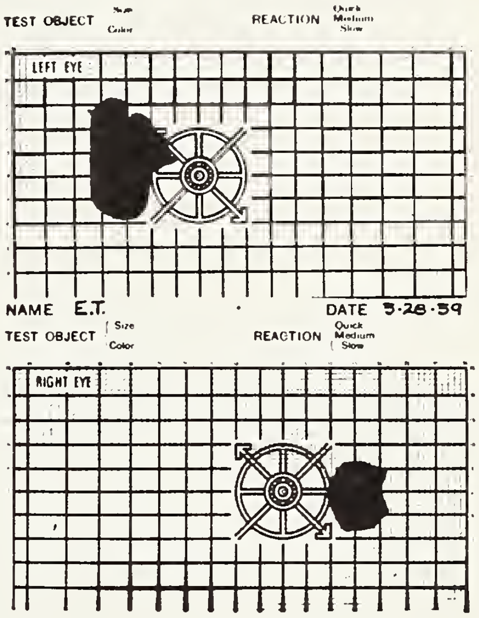
TEST OBJECT Size Color
REACTION Quick Medium Slow
LEFT EYE
NAME E.T.
DATE 5·28·39
TEST OBJECT Size Color
REACTION Quick Medium Slow
RIGHT EYE

Fig. 14. Central fields, Case 4.

Case 2.—Mrs. N. N., aged sixty-six, was first seen in April 1936 complaining of reduced vision and asthenopia. Corrected vision: right 20/20, left 20/15. Tension: right 17 mm., left 17 mm. Each optic nerve shows cupping with considerable atrophy. The left field showed marked contraction while the right eye had peripheral scotomata. General physical examination by Dr. E. M. Jones was negative and x-ray examination failed to disclose any calcerous vascular changes. Improvement following liver therapy has been maintained for several months (Figs. 7, 8 and 9).

Case 3.—Miss G. J., aged seventy-six, has been under observation since March 1936 because of failing vision of both eyes, especially for distance. Corrected vision: right 20/30, left 20/40. The fundi showed slight cupping of both optic nerves seen indistinctly because of nuclear sclerosis. Tension: right 17 mm., left 17 mm. There was some increase in the nearsighted correction and nuclear sclerosis which reduced vision to: right 20/40, left 20/50, although no marked increase in cupping or reduction of the peripheral field. During the summer of 1938 she had liver therapy and Vitamin B with some improvement in vision but vision of the left eye was reduced to 20/100. Reduced vision might be accounted for by the nuclear sclerosis but the central field shows a scotoma bordering on central vision and connected to blind spot. The cupping of each optic nerve is shown in the diagram (Figs. 10, 11 and 12).

Case 4.—Mrs. E. T., aged seventy-seven, complained of failing vision for the past few years. Corrected vision: right 20/30, left 20/100. Tension: right 28 mm., left 28 mm. Fields show marked concentric contraction. Fundi: right, marked cupping without loss of color; left, marked cuping with atrophy. Tension recorded for several days in hospital and never above 28 in spite of complete mydriasis. There was decided improvement after liver extract therapy and Vitamin B. The central vision of the left eye improved from 20/100 and 20/30 (Figs. 13 and 14).

The meeting adjourned.

A. G. Schulze, *Secretary.*

SULFANILAMIDE AND SMALLPOX

In *The Journal,* May 13, 1939, p. 1936, appears a report of the treatment of four cases of smallpox with sulfanilamide. In three there was only an evanescent macular eruption which rapidly disappeared, and in the remaining case there were only three pustules. Three additional patients were treated only symptomatically and in all three the typical eruption of smallpox developed. However, because of the low case fatality rate of smallpox, conclusions as to the value of sulfanilamide in preventing mortality from this disease cannot be drawn from the four cases thus treated. (J.A.M.A., May 13, 1939, p. 1971.)

TRUTH ABOUT MEDICINES—NEW AND NON-OFFICIAL REMEDIES

The following products have been accepted by the Council on Pharmacy and Chemistry of the American Medical Association for inclusion in New and Nonofficial Remedies:

Sulfapyridine.—[An abstract of the Council's statement on the actions, uses and dosage of sulfapyridine is impossible. The reader is, therefore, referred to the description which appears on page 1831 of *The Journal,* May 6, 1939.]

Ampoule Solution Sodium Morrhuate 5% with Benzyl Alcohol 2%, 2 c.c.—Each cubic centimeter contains sodium morrhuate (New and Nonofficial Remedies, 1938, p. 448) 0.05 Gm. (¾ grain) and benzyl alcohol 0.02 Gm. (⅓ grain) in aqueous solution. The Upjohn Company, Kalamazoo, Mich.

Solution Sodium Morrhuate 5% with Benzyl Alcohol 2%, 30 c.c. Vials.—Each cubic centimeter contains sodium morrhuate (New and Nonofficial Remedies, 1938, p. 448) 0.05 Gm. (¾ grain) and benzyl alcohol 0.02 Gm. (⅓ grain) in aqueous solution. The Upjohn Company, Kalamazoo, Mich.

Ampoule Solution Sodium Morrhuate 10% with Benzyl Alcohol 2%, 2 c.c.—Each cubic centimeter contains sodium morrhuate 0.1 Gm. (1½ grains) and benzyl alcohol 0.02 Gm. (⅓ grain) in aqueous solution. The Upjohn Company, Kalamazoo, Mich.

Solution Sodium Morrhuate 10% with Benzyl Alcohol 2%, 30 c.c. Vials.—Each cubic centimeter contains sodium morrhuate 0.1 Gm. (1½ grains) and benzyl alcohol 0.02 Gm. (⅓ grain) in aqueous solution. The Upjohn Company, Kalamazoo, Mich.

Rabies Vaccine-Human (Phenol-Killed).—Antirabic vaccine (New and Nonofficial Remedies, 1938, p. 402) prepared according to the general method of Sir David Semple. Sterility, toxicity and safety tests are made. It is marketed in packages of seven 0.5 c.c. ampule-vials (without syringe) and in fourteen 0.5 c.c. ampule-vials (with syringe). National Drug Company, Philadelphia. (J.A.M.A., May 6, 1939, p. 1831.)

Racephedrine Hydrochloride-Gane's Chemical Works, Inc.—A brand of racephedrine hydrochloride-N.N.R. (J.A.M.A., April 1, 1939, p. 1257). Gane's Chemical Works, Inc., New York. (J.A.M.A., May 13, 1939, p. 1951.)

Concentrated Antipneumococcic Serum, Types IV and VIII-Squibb.—An antipneumococcus serum types IV and VIII combined (J.A.M.A., June 18, 1938, p. 2082) prepared by immunizing horses with intravenous injections of cultures of types IV and VIII pneumococci. The serum is refined and concentrated by the method of Lloyd D. Felton. The usual sterility and safety tests are made, as required by the regulations of the U. S. Public Health Service. It is marketed in vials containing 20,000 and 50,000 units respectively of each type. E. R. Squibb & Sons, New York.

Concentrated Antipneumococcic Serum, Types V and VII-Squibb.—An antipneumococcus serum types V and VII combined (J.A.M.A., June 18, 1938) prepared by immunizing horses with intravenous injections of cultures of types V and VII pneumococci. The horses are bled aseptically and the serum is refined and concentrated by the method of Lloyd D. Felton. The usual sterility and safety tests are made, as required by the regulations of the U. S. Public Health Service. The product is marketed in packages of one vial containing 20,000 units and 50,000 units respectively each of types V and VII. E. R. Squibb & Sons, New York.

Barbital Sodium Tablets, 5 Grains.—Each tablet contains barbital sodium-Abbott (New and Nonofficial Remedies, 1938, p. 129) 5 grains. Abbott Laboratories, North Chicago, Ill.

Suprarenalin Solution 1:1,000 in 1 c.c. Ampules (For Hypodermic Use). Armour Laboratories, Chicago, Illinois.

Suprarenalin Solution 1:1,000 in 10 c.c. Vials (For Hypodermic Use). Armour Laboratories, Chicago, Illinois.

Suprarenalin Solution 1:1,000 in 1 oz. Bottles (For Parenteral Use). Armour Laboratories, Chicago, Illinois.

Suprarenalin Solution 1:10,000 in 1 c.c. Ampules (For Hypodermic Use). Armour Laboratories, Chicago, Illinois. (J.A.M.A., May 27, 1939, p. 2137.)

TRANSACTIONS of the MINNEAPOLIS SURGICAL SOCIETY

Stated Meeting, April 6, 1939

Vice President, DR. THOMAS KINSELLA, in the Chair

TRAUMATIC RUPTURE OF THE NORMAL SPLEEN WITH DELAYED HEMORRHAGE

Case Report

R. C. Webb, M.D.

A school boy, aged eight years nine months, was admitted to the Asbury Hospital in Minneapolis on Friday, February 24, 1939, one week after injury.

Complaints: Pain in the upper left abdominal quadrant, weakness, vomiting, fever and anemia.

Present Illness: On Friday, February 17, 1939, at 4:30 p. m., while watching a high school hockey game he was struck in the upper left quadrant of the abdomen by a hockey puck. He was dressed for the outdoors and wore a corduroy jacket. He immediately complained of pain, doubled up and became weak but did not fall, and he acted as though his wind were knocked out of him. He walked about thirty feet, bent over toward the affected side, and he then asked to be carried. He vomited about thirty minutes after injury. He was very restless Friday night and complained of his stomach feeling hard. Saturday afternoon he was up and about and walked seven blocks. On Sunday he was considerably improved, ate his breakfast and went to Sunday School, but he still had pain in his upper left abdomen, and he walked slightly stooped over. On Monday and Tuesday he went to school. On Monday his hemoglobin was taken and was found to be 74 per cent. On Tuesday afternoon at 4 o'clock while getting his clothes on to leave school he had an attack of severe pain in the upper left abdomen, and he became weak and vomited and was carried home.

He was placed in bed and alternately hot and cold packs were placed on the abdomen. On Wednesday he became weaker and the treatment was continued throughout Wednesday and Thursday. Thursday evening he had a temperature of 101 F., and his hemoglobin was found to be 40 per cent. A rupture of the spleen was diagnosed. He was placed in an automobile and was brought 160 miles to Minneapolis.

Past history was unimportant.

Physical examination revealed a temperature of 101.8 degrees, pulse 124, respirations were normal. Lips were pale and swollen. The left upper abdominal quadrant was tender and slightly rigid. The abdomen was slightly distended. There was increased dullness in the splenic area and shifting dullness in the flanks. Blood pressure was 106/74. Physical examination was otherwise normal.

Blood examination on admission was as follows: hemoglobin, 52 per cent; red blood cells, 2,900,000; white blood cells, 11,200; polymorphonuclears, 61 per cent.

X-ray examination was made of the chest and abdomen. The left diaphragm shadow was elevated. The ribs were normal. There was increased density in the upper left quadrant with slight displacement of the stomach toward the right side.

Patient was placed at rest in bed and the pulse rate dropped to 120 per minute. The blood examination was repeated after six hours and the hemoglobin was 42 per cent, the R. B. C. was 2,600,000. He was given a transfusion of 300 c.c. of citrated blood and was operated upon on Friday, February 24, 1939. An upper left rectus incision was made and on opening the peritoneum dark blood gushed from the incision and the abdomen was distended with dark blood with numerous clots in the upper left quadrant. The spleen was found to be about twice normal size, and there were two subcapsular hematomas on the lateral surface and a laceration at the junction of the upper and middle thirds of the spleen. The spleen was removed and the wound was closed without drainage, using fine silk. No effort was made to remove the blood from the abdomen. A transfusion of 300 c.c. citrated blood was given immediately after the operation.

Convalescence was uneventful. Temperature reached normal the third day after operation, and the pulse became normal on the sixth day after operation. The hemoglobin steadily improved and registered 72 per cent when the patient was discharged from the hospital on the twelfth day after operation.

Discussion

Dr. Martin Nordland: Dr. Webb's case report was both interesting and instructive. He did not discuss the technic of splenectomy and I would like to make a few remarks on this point.

The spleen makes up about one per cent of the total body weight and is known to be a very vascular structure. In the excision of the spleen, because of its great vascularity, one should attempt to preserve as much of the blood that is in the organ as possible for the patient. Therefore, the vessels of the pedicle should be ligated separately, clamping the artery first and waiting a sufficient time for the organ to empty as much of its blood through the vein as possible before the ligature is applied to it.

Dr. A. A. Zierold: Everyone, from time to time, sees ruptures of the spleen with immediate hemorrhage which, while not common, certainly are not rare, but delayed rupture, the subcapsular injuries of the spleen, certainly are much rarer than the ordinary type. I judge from Dr. Webb's remarks, that he had in mind only subcapsular rupture with delayed hemorrhage. Most of the foreign literature reports these cases as two-stage hemorrhages or two-stage ruptures, and in many of the articles concerning rupture of the spleen no distinction is made between delayed and immediate hemorrhage.

Lawrenz reported some 235 cases of rupture of the spleen in 1900 and probably about that time ruptures of the spleen attained their greatest attention because it was only a short time before that the first operation for rupture of the spleen had been performed. In his list of cases he makes no distinction between immediate hemorrhage and delayed hemorrhage, and while I do not recall all of the cases reported, there were several that had developed symptoms from seven to ten or eleven days, which, as Dr. Webb states, is the usual interval.

In 1938 at the General Hospital there were three cases of delayed hemorrhage that perhaps might fall within this group. These occurred the second, third and fourth day following injury; technically delayed hemorrhage, perhaps subcapsular, but probably not the classical picture of the subcapsular injury of the spleen.

My personal experience is limited to one case. I had seen an old man who had sustained a bruise on his left side from which he had apparently recovered and I was examining him to see the result of his injury and the extent of disability. I saw him a week after injury, at which time he was somewhat sore but presenting no other symptoms than just slight muscular tenderness in the left flank. I considered him as convalescent and ready to be up and about and dismissed the matter from my mind. I was told that the second week following his injury he had gotten up, walked to the grocery store, collapsed and died from a subcapsular rupture and delayed hemorrhage of the spleen.

The picture seems to be fairly definite. The symptomatology, as Dr. Webb has detailed it, seems to be rather uniform in all of the reports but I think it is most desirable that subjects such as this be brought to our attention. It would seem advisable in all suspected cases that the period of observation be extended, long past what we would ordinarily consider sufficient for a bruise of the muscle of the back or the side.

PROTRUDED INTERVERTEBRAL DISC

Case Report

H. M. Lee, M.D.

Case 1.—N. A., a white male, aged twenty-eight, was first examined October 5, 1938.

Complaints: Pain in lower back with radiation into right thigh and leg. Weakness and atrophy of right thigh.

History of Present Condition: About the middle of October, 1937, he had cranked a car for about fifteen minutes. There was no immediate pain in the back. A few days later he noted pain in the lower back, radiating along the lateral surface of the right thigh. The pain became progressively more severe and he was then disabled for two weeks. He was seen by a physician, who made a diagnosis of sciatic neuritis. He had several injections of sodium salicylate and sodium iodide with no relief. His symptoms finally abated to some degree so that he was able to resume his occupation but continued to have at least intermittent pain in the lower back radiating into the right thigh, the pain at times being almost unbearable. By July, 1938, he noticed atrophy in the muscles of the right thigh. During the summer of 1938 he received a series of chiropractic treatments with no relief.

Examination: Height, 6 feet; weight, 130 pounds. General physical examination negative except for definite atrophy of the right thigh with marked weakness in entire extremity and absence of knee jerk on the right side. Other reflexes were normal. There was no scoliosis. X-rays of lumbar spine and pelvis were negative. Urinalysis negative.

On October 10, 1938, he was admitted to Asbury hospital for spinal fluid examination. Manometric readings were within normal limits. Spinal fluid was clear. 11 lymphocytes; globulin present; total protein 65 mgms. Spinal fluid Wassermann and Kline both negative. Nonne negative.

On November 7, 1938, 4 c.c. of lipiodol were injected into the subarachnoid space through the third lumbar intervertebral interspace. Fluoroscopic and x-ray examinations revealed an obstruction at the second lumbar intervertebral space.

Operation.—On January 26, 1939, under gas-ether anesthesia, a bilateral laminectomy was performed involving the first and second lumbar vertebræ. When these laminæ had been removed, a very dense ligamentum flavum was noted and at the right side of this ligament there was an indefinite mass, apparently attached to the ligament. This mass with the ligament was resected. The cord was rotated to expose the spinal nerve roots at this level. These were apparently normal. No protrusion or obstruction was noted anterior to the cord. The dura was opened and the lipiodol sucked out. Some of the fibers of the cauda appeared somewhat injected but otherwise normal. The dura was closed with fine silk. The patient made an uneventful recovery and he was discharged from the hospital on February 7, 1939. He resumed his occupation on April 3, 1939, and has been free from pain, and he states that his right leg is getting stronger.

This man was disabled for a period of nine weeks following his laminectomy.

Pathologist's report on tissue removed.—"Section shows tissue to be a piece of fibrocartilage."

Case 2.—A. B., a white male, aged 40, 5 feet 9 inches in height and weighing 150 pounds.

This man, a truck driver, first came under my care on January 27, 1938. His complaints at that time were pain in the lower back with radiation into the left thigh, leg and foot.

History of Present Condition.—On June 2, 1937, while removing a tire from his truck he felt a sudden pain in the lower back, in the lumbo-sacral region. Five days later the pain radiated down the left leg. He continued to work until October 16, 1937, in spite of his discomfort, but was then unable to continue. He consulted chiropractors and medical men in his home town in Montana. He obtained no relief and continued to be disabled.

Past History: Entirely negative.

Family History: Negative.

Physical Examination: The general physical examination was entirely negative except for bilateral inguinal herniæ and obvious evidence of trouble in the lower back. There was a marked inclination of the trunk to the right with definite rigidity of the erector-spini muscles. The left thigh could be flexed through an angle of 60 degrees while the right could be flexed through an angle of 90 degrees. He localized his pain in the region of the left sacro-iliac joint on to buttock and along the course of the left sciatic nerve. There was some atrophy of the muscles in the left thigh and calf. Reflexes were all normal. The blood Wassermann was negative. X-rays of lumbar spine and pelvis revealed no evidence of fracture or dislocation. There was noted, however, a scoliosis with rotation of lumbar spine toward the left with a resulting tilting of pelvis. There were also arthritic changes in the fourth and fifth lumbar vertebræ. The patient was hospitalized and conservative treatment instituted consisting of rest in bed, large doses of salicylates, and finally stretching of the left sciatic nerve with only slight relief. He was discharged from the hospital for a period but was re-admitted on March 13, 1938, at which time a fasciotomy was done over the left thigh. This appeared to give some relief. He was discharged from the hospital and returned to his home in Montana. However, he continued to be disabled and sought further medical and other treatment in his home community.

On February 3, 1939, he again came under our care. His complaints were exactly as they had been at the time of our previous examination in January, 1938. The physical findings were essentially the same. Reflexes were all normal except for absence of the cremasteric reflex on both sides. This, I believe, can be accounted for by the fact that a bilateral herniotomy had been performed and all cremasteric fibers removed. Complete x-ray films were again made of the lumbar spine and pelvis. Findings were identical with those previously reported.

On February 7, 1939, a spinal puncture was made through the fourth interspace. The manometer registered 110 millimeters. Oscillations were low. Jugular compression increased the pressure to 220. On release of the jugular compression the spinal fluid pressure dropped rather promptly to 120. The spinal fluid was clear. The spinal fluid Wassermann was negative. Total protein was 30 mgms.

On February 13, 1939, 5 c.c. of lipiodol were injected in the second interspace. Subsequent fluoroscopic and x-ray examination revealed evidence of obstruction between the fourth and fifth lumbar vertebræ and a suggestion of a similar defect but to a lesser degree between the second and third lumbar vertebræ.

Operation.—On February 23, 1939, under general anesthesia, a laminectomy was performed involving the third, fourth, and fifth lumbar vertebræ. The ligamentum flavum between the fourth and fifth was greatly thickened. This was resected. The cord was rotated, exposing the third and fourth dorsal roots, the fourth root on left side appearing somewhat edematous. As the cord was rotated there was noted a bulging of the fourth intervertebral disc. The posterior longitudinal ligament was incised and the disc tissue escaped. The dura was opened and the lipiodol sucked out. There was no intradural pathology noted except perhaps slight edema of the fourth left root. The dura was closed with fine silk. The patient made an uneventful recovery and was discharged from the hospital on March 17, 1939, returning to his home in Montana on that date.

This patient was allowed out of bed on the twelfth postoperative day. His sciatic pain had completely disappeared and the scoliosis was absent. I received a letter from this patient dated March 30, 1939, in which he states that his pain is gone and that he can now really straighten up, referring to his back.

I anticipate that this man will be able to resume some occupation in ten or twelve weeks from date of his operation.

Pathologist's Report.—"Section shows piece of fibrous tissue (ligamentum flavum). Another section shows a mass of fibrocartilage" (intervertebral disc).

Discussion

Dr. Edward T. Evans (by invitation): I don't think the answer to low back complaints is as yet written. I think we are going to find out more and more about these cases and are going to gradually evolve some judgment with reference to the treatment thereof. This without criticism one way or the other, except I think that conservative treatment should always be carried out in every back complaint and operative procedure reserved as a last resort.

I had the occasion last week to have the privilege of reading a paper which will be presented in Surgery magazine, by Dr. Horowitz of, I believe, Philadelphia, of seventy-five consecutive autopsies with special reference to the spine. I think it would behoove all of you to read it. It has some very interesting data on the frequency with which discs, hypertrophies of capsules, periarticular capsules, and so on, occur in spines which give no history of complaints during life. Those reports will give us something upon which to base our judgment. I think there is no question whatsoever but that laminectomy for the prolapsed intervertebral disc gives result. The question in my mind is—are we operating upon a symptom and is it the decompresing laminectomy, after all, which gives the result.

OBSERVATIONS ON THE TREATMENT OF INTRACAPSULAR FRACTURES OF THE NECK OF THE FEMUR

Earl C. Henrikson, M.D.

Inaugural Thesis—Summary

Dr. Henrikson studied a series of 102 cases of intracapsular fracture of the hip admitted to the Minneapolis General Hospital in the four years from 1935 to 1939. His study brought out the following points:

There were twenty-four patients treated in *Whitman casts.* Their average age was fifty-nine. Of eleven impacted fractures so treated, all united. Of thirteen non-impacted fractures only 46 per cent united. None of the twenty-four died.

There were fifty-eight patients treated by *internal fixation.* Their average age was sixty-six. Four were impacted. One of these died. In the three survivors the fracture united. Fifty-four were non-impacted fractures. Ten died and thirty-four of the forty-four survivors, or 77 per cent, united.

There were thirteen patients treated by *bed rest* alone, seven by *traction,* and 3 in *walking spicas.* Their average age was seventy. Eleven were impacted, of whom one died. In all ten survivors the fracture united. Only 20 per cent of the five surviving non-impacted fractures united.

Eliminating the impacted fractures (100 per cent of the survivors having united) by far the best results were obtained in those treated by internal fixation (77 per cent union).

A study of the mortality shows that there has been a drop from 50 per cent, in the period from 1920 to 1930, to 10 per cent in 1938. From 1920 to 1930, most were treated by the Whitman method. Of thirty-three admitted in 1938 all but three were treated by internal fixation regardless of condition. Thirty-four operations were performed with but two deaths—one from an embolism on the fifth postoperative day and one from broncho-pneumonia on the ninth postoperative day. Immediate operation in practically all cases was recommended to offset development of complications which would be contraindications to surgery.

Infection developed in five of sixty-four operations. Three operations followed by infection took less than an hour, two less than two hours. Prolonged operations were not more prone to sepsis. All five fractures were of over two weeks standing, three over a month. Only one was done under local anesthesia. Three had the so-called "open" operation in which the fracture site is exposed to view. There had been no infections in the past eight months in about twenty-five cases since crystalline sulfanilamide had been implanted in the wound.

There were sixteen patients who developed non-union due to slipping of the nail or fragments or due to necrosis of the head or neck. The fracture slipped out of position in fourteen patients within three or four months of the operation. Five were renailed, of whom four united and one failed to unite due to metastasis from a carcinoma of the prostate. Three died. Two had McMurray osteotomies—one with a fair and one with a poor result. One patient developed a sterile necrosis of the head, another head necrosed due to infection. Deducting the four cases uniting after renailing there were twelve non-unions—20 per cent. There were twelve subcapitals, two central and two oblique fractures. The average time to slipping was ninety days. The reduction and nailing was favorable in seven and unfavorable in six. A spica cast may have prevented slipping in eleven of fourteen. His study revealed that where there was accurate reduction and perfect nailing, 85 per cent obtained bony union, whereas, when the reduction was poor and the nailing inaccurate, 85 per cent resulted in non-union.

Dr. Henrikson came to the conclusion from a study of this series that the percentage of unions in non-impacted fractures of the neck of the femur might be materially increased (1) by more perfect reduction and nailing, which can be accomplished in most cases if the Leadbetter technic for reduction is used, and if the forefinger is used to palpate the anterior and inferior surface of the neck of the femur to orient the surgeon before inserting the guide wires and nails; (2) by applying external fixation in the form of short light spica casts to all cases internally fixed in order to more adequately prevent motion at the fracture site.

He stressed the importance of an x-ray immediately in all old persons who fall and complain of pain in the hip, thigh, or knee. The patient's knees should be bandaged together to prevent abduction and external rotation and consequent disimpaction. When impaction is maintained, 100 per cent unite when placed in a plaster spica and the mortality is practically nil.

The meeting adjourned.

Harvey Nelson, *Secretary.*

BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

BOOKS RECEIVED FOR REVIEW

Diseases of the Nose and Throat. Second Edition. Charles J. Imperatori, M.D., F.A.C.S., Professor of Otolaryngology, New York Polyclinic Medical School and Hospital, etc., etc., and Herman J. Burman, M.D., F.A.C.S., Adjunct Professor of Otolaryngology, New York Polyclinic Medical School and Hospital, etc., etc. 726 pages. Illus. Price, $7.00, cloth. Philadelphia: J. B. Lippincott Co., 1939.

Personal and Community Health. Fifth Edition. C. E. Turner, A.M., Sc.D., Dr.P.H., Professor of Biology and Public Health, Massachusetts Institute of Technology; formerly Associate Professor of Hygiene, Tufts College Medical and Dental Schools, etc. 652 pages. Illus. Price, $3.00, cloth. St. Louis: C. V. Mosby Co., 1939.

Syphilis and Its Accomplices in Mischief: Society, the State and the Physician. George M. Katsainos, M.D. 676 pages. Price, $5.00, paper cover. Privately printed by the Kyklos Publishing Co., Athens, Greece, 1939.

Life and Letters of Dr. William Beaumont. Jesse S. Myer, A.B., M.D. Late Associate in Medicine in Washington University, St. Louis. Introduction by Sir William Osler, B.T., M.D., F.R.S., late Regius Professor of Medicine in Oxford University, England. 327 pages. Illus. Price, $5.00, cloth-backed stiff cover. St. Louis: C. V. Mosby Co., 1939.

What It Means to Be a Doctor. Dwight Anderson. 96 pages. Cloth, $1.00, paper, 25c. New York: Public Relations Bureau, Medical Society of the State of New York, 2 East 103rd St., 1939.

The Patient as a Person. A Study of the Social Aspects of Illness. G. Canby Robinson, M.D., LL.D., Sc.D. Lecturer in Medicine Johns Hopkins University. 423 pages. Price, $3.00, cloth. New York: The Commonwealth Fund, 41 East 57th St., 1939.

Cancer of the Breast and Cancer of the Uterus. Second Edition. Marion Ellsworth Anderson, A.B., M.D. 106 pages. Illus. Price, $1.00, paper. Franklin Press, Clinton, Iowa.

Cancer Handbook of the Tumor Clinic of Stanford University School of Medicine. Editor Eric Liljencrantz, M.D. Chief of Tumor Clinic, Stanford University School of Medicine; Consultant in Neoplastic Diseases, U. S. Naval Hospital, Mare Island, and U. S. Marine Hospital, San Francisco. 114 pages. Illus. Price, $3.00, cloth. Stanford University Press, Stanford University, Calif., 1939.

Clinical Pathological Gynecology. J. Thornwell Witherspoon, B.S., B.A., M.A., M.D. Formerly Associate Professor Experimental and Pathological Gynecology, Indiana University Medical Center, Indianapolis. 400 pages. Illus. Price, $6.50, cloth. Philadelphia: Lea & Febiger, 1939.

Practice of Allergy. Warren T. Vaughan, M.D., of Richmond, Va. 1082 pages. Illus. Price, $11.50, cloth. St. Louis: C. V. Mosby Co., 1939.

A Textbook of Obstetrics. With Special Reference to Nursing Care. Charles B. Reed, M.D., F.A.C.S. Associate Professor of Obstetrics, Northwestern University Medical School; Head of Obstetrical Department, Wesley Memorial Hospital, Chicago. 476 pages. Illus. Price, $3.00, cloth. St. Louis: C. V. Mosby Co., 1939.

Varicose Veins. Alton Ochsner, B.A., M.D., D.Sc. (Hon.), F.A.C.S. William Henderson Professor of Surgery and Director of Department of Surgery, School of Medicine, Tulane University of Louisiana. 147 pages. Illus. Price, $3.00, cloth. St. Louis: C. V. Mosby Co., 1939.

Sociology and Social Problems. A Textbook for Nurses. Deborah MacLurg Jensen, R.N., B.Sc. Social Service Consultant to the Visiting Nurse Association, St. Louis; Lecturer in Nursing Education, Washington University; formerly Assistant Director, School of Nursing, Washington University. 341 pages. Price, $2.75, cloth. St. Louis: C. V. Mosby Co., 1939.

PRINCIPLES OF HEMATOLOGY. Russell L. Haden. Philadelphia: Lea & Febiger, 1939.

In this manual, Dr. Haden has set out "to simplify the study of the disorders of the blood for the student and physician."

He has succeeded in this endeavor. With the aid of ingenious diagrams, he presents the current present knowledge and theory of the normal and abnormal morphology and physiology of the blood in a concise and orderly fashion. Doctor Haden adheres to the polyphyletic teaching of Sabin and Doan, in connection with the origin of the blood cells, but the monophyletic views of Downey are given adequate space.

Following this section there is an excellent summary of the essential laboratory methods in hematology. The blood diseases themselves are described, and their treatment discussed in conjunction with one hundred case histories which are a novel and valuable feature.

One might venture to disagree with Doctor Haden, that the macrocytic anemia of hepatic cirrhosis "is due to a deficient supply to the bone marrow of the erythroycte maturing factor." This anemia is in most instances hemolytic, and is benefited very little by liver extract. A regrettable omission is the lack of a reference to Watson's methods for determination of urobilinogen in feces and urine, which have proved so valuable in the analysis of obscure anemias, particularly of the hemolytic type.

In general, however, Doctor Haden's book can be highly recommended to those seeking a simple exposition of modern hematology.

J. J. Boehrer, M.D.

SURGICAL TREATMENT OF HAND AND FOREARM INFECTIONS. A. C. J. Bruckel, A.B., M.D. 300 pages. 166 text illustrations; 35 black and white illustrations; 10 color plates. St. Louis: C. V. Mosby Company, 1939.

The anatomic aspects of the hand and forearm have been dealt with very carefully, and the radiopaque injections of the hand spaces have been presented with meticulous care. The author states that the mid-palmar and thenar spaces are those commonly involved. This statement does not coincide with the description of other authors. The descriptive matter of the terminal closed spaces and the many illustrations (including ten in color) have been carefully presented, with practical clinical notes at the end of each subject.

This book has brought to a definite focus all the clinical manifestations, as well as the technic in treating acute infections of the hand and forearm, in a clear and concise fashion and completely covers the subject.

Paul H. Kelly, M.D.

CLINICAL PATHOLOGICAL GYNECOLOGY. J. T. Witherspoon, M.D. 400 pages. Illus. $6.50. Philadelphia: Lea & Febiger, 1939.

The author states in the preface that the motive for writing this book was prompted by the experience which he gained when he conducted a course on Clinical Pathological Gynecology, and that his motive was to present to the reader both the pathological and the clinical pictures of these disease conditions. There are many pathological conditions which could justifiably be included under this general heading but the author purposely omitted them feeling that they were presented better in other well known books.

This book is of three hundred and seventy-five pages and has two hundred and seventy-one very excellent engravings. The subject-matter is taken up in a very systematic manner, and at the end of each chapter or section the various references are listed. In every paragraph throughout the whole book the important word, phrase, or clause is brought to the reader's attention by being in heavy type. The text throughout is brief and to the point.

Albert G. Schulze, M.D.

THE VAGINAL DIAPHRAGM: ITS FITTING AND USE IN CONTRACEPTIVE TECHNIQUE. Le Mon Clark, M.S., M.D. 106 pages. Illustrated. Cloth, $2.00. St. Louis: The C. V. Mosby Co., 1939.

This book is an excellent, concise monograph concerning the technique of fitting and instructing a patient with the vaginal diaphragm which, when used with a spermicidal jelly, is generally accepted as the most effective contraceptive method now available. With the acceptance of the fact that a knowledge of, and the ability to instruct and fit a patient with a reliable contraceptive method should be a part of most physicians' armamentarium, Dr. Clark clearly discusses all phases of the vaginal diaphragm method—illustrations clarify his comments. This book could well be used as a textbook for medical students, physicians in general practice, and as a reference book for birth control clinics and gynecologists.

E. C. Bagley, M.D.

MEDICINE IN MODERN SOCIETY. By David Riesman, M.D., Professor History of Medicine, Princeton University. 215 pp. Price $2.50. Princeton University Press, 1938.

This volume consists of some fifteen chapters, the first, largely historical, dealing with the developments of modern scientific medicine. There follows a discussion of medical progress, in which the author takes up various discoveries which he selects as the peaks or high spots in the development of scientific medicine. These discoveries are totally unrelated and vary from the discovery of the hypodermic needle, the transmission of disease by insects, antitoxins, x-ray, et cetera. The material is most interesting, and, written as it is, in a popular style, with the personal touch of a really astute clinician, it should have a wide appeal. Such subjects as cancer, from the historical standpoint, psycho-analysis, middle-age medicine, leisure and health, are entertainingly presented. The chapter devoted to medical ethics is particularly interesting and well presented. At the end the author indulges in a chapter on social medicine in which he seems to lose contact with reality, and, like so many of our present-day writers, seems to indulge in a great deal of wishful thinking without an accurate grasp of the realities and the practical difficulties in the way of idealistic programs. On the whole, however, the book is well worth reading.

C. B. W.

PRACTICE OF MEDICINE. Second edition. Jonathan Campbell Meakins, M.D., LL.D., Professor of Medicine, McGill University, et cetera. 1413 pages. Illus. Price, $12.50. St. Louis: C. V. Mosby Co., 1938.

The second edition of the *Practice of Medicine* is an improvement over the first. This improvement is a natural one and is the result of the discovery of newer methods of therapeutics. As in the first edition, Doctor Meakins has put forward a valuable "instrument" in the hands of the medical profession. This "instrument" is of value to the general practitioner and internist. He still discusses the various diseases and the derangements of the body in a very clear-cut manner and carries throughout a common sense philosophy which will stimulate the reader to do some solid thinking himself. The illustrations throughout the book are valuable and there is no doubt that they make it more practicable.

Although the author pays very little attention to anatomical changes in dealing with any of the diseases, he has arranged the chapters of the book in an anatomical order. This, I think, makes the entire work more lifelike and interesting. It helps to correlate the disease processes in various parts of the body and aids the reader in thinking of the human being as a complete individual.

It is difficult to select any particular chapter as being of more value or educational than another. However, I think that Chapter V., which deals with diseases of the lung is a very good example of the general trend of thought that is carried throughout the *Practice of Medicine.* The author spends considerable time in discussing the nature and cause of symptoms. As an example of this, I would suggest that all doctors, regardless of their specialty, read the discussion of cyanosis. This will demonstrate to the reader the value of a practical knowledge of physiology and physiological chemistry in diagnosis and treatment. The discussion of symptoms shows a keen analysis and recognition of the altered physiology of the sick.

The author expresses general ideas in the introductory chapter. This chapter should be read by all. Doctor Meakins generalizes on the doctor and the patient. He paints a picture of the doctor as he really should be and probably is. He tells how the doctor should evaluate the stories given by the patient and from these, to arrive at a diagnosis which is as nearly correct as possible.

I think that the entire book is a valuable contribution to the medical profession.—Joseph M. Ryan, M.D.

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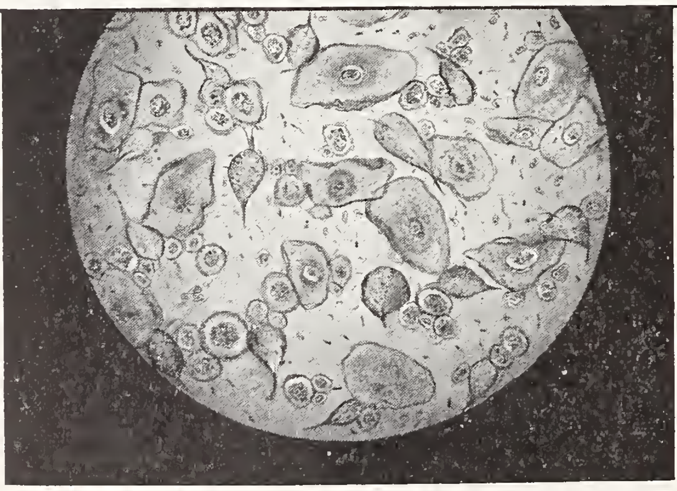

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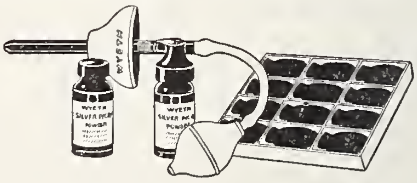

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THE DIAGNOSIS AND TREATMENT OF LOW BACK AND SCIATIC PAIN CAUSED BY PROTRUDED INTERVERTEBRAL DISK AND HYPERTROPHIED LIGAMENTS*

WINCHELL McK. CRAIG, M.D., and MAURICE N. WALSH, M.D.

Rochester, Minnesota

THE disabling effect of chronic low back pain and sciatic pain has resulted in many suspected causes and diverse methods of treatment. It is logical to assume that systemic diseases as well as local osteogenic and neurogenic lesions may be an underlying or contributory cause and this assumption has influenced the type of treatment that has been instituted.

As a definite etiologic agent, certain specific conditions have been assigned, such as the "facet syndrome" (arthritis of the facets), tense fascia lata, hypertrophied ligamenta flava (compression of the nerve roots), posterior protrusion of intervertebral disks, irritation of the posterior divisions of spinal nerves originating in pathologic processes in the muscles and ligaments and fascial adhesions.

At present, the most probable of these suggested etiologic agents of low back pain and sciatic pain is posterior protrusion of the intervertebral disks of the lumbar region, which may or may not be associated with hypertrophied ligamenta flava.

The possible causes of, or contributing factors to, the production of low back pain and sciatic pain are congenital anomalies, trauma, tumors, infection, postural defects and psychogenic factors. It is important to realize that the symptoms and signs presented by the patient may have multiple causes and that more than one of the factors mentioned may be at work. Congenital skeletal anomalies are not uncommon in the lower lumbar and sacral regions of the spinal column. They are often benign and often appear to have no significance. At The Mayo Clinic, in a series of 300 cases in which posterior protrusion of an intervertebral disk was proved at operation, minor skeletal anomalies have been seen frequently. Congenital, vascular intraspinal anomalies are seen occasionally, and they usually present the clinical picture of a tumor of the spinal cord or cauda equina. Consequently, the physician should not infer that with the finding of a congenital anomaly in roentgenologic studies of the lumbar or sacral regions of the spinal column, the cause of the sciatic or low back pain of which the patient complains has been found. It is probable that congenital anomalies are actually rare causes of these symptoms.

Trauma is of course an important cause of this type of pain. From our experience we are led to believe that posterior protrusions of the intervertebral disks are traumatic in origin and that in some cases they are probably the result of several injuries rather than of one severe injury. The explanation of this is that the restraining annulus fibrosus is ruptured or weakened by undue stress and strain, following which the nucleus pulposus protrudes or herniates into the spinal canal with subsequent encroachment on the nerves.

The intervertebral disks acting as shock absorbers between the vertebræ are composed of a nucleus pulposus, which is encircled by a fibrocartilaginous structure known as the annulus fibrosus. When the spinal column is subjected to stress and strain the disk may bulge in all directions but normally it returns to its natural position, where it is maintained by vertebral ligaments, principally the anterior and posterior longitudinal ligaments. Following trauma to the vertebral column or during unusual stress or strain the disk itself or its center, the nucleus pulposus, may be extruded beyond normal limits and fail to return to its original position. The protrusions that cause clinical symptoms are those that occur posteriorly and they evidently occur most often in this location because of the mechanical forces at the time of injury to the spine. Most of the injuries occur when the spine is in flexion, producing undue stress on the posterior portion of the annulus fibrosus, the anterior portion of the vertebral interspace being narrowed. In this manner the compressible nucleus pulposus is pressed backward against an overstretched and weakened annulus fibrosus, which may not give way the first time, but extrusion may result during a subsequent injury.

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*From the Section on Neurologic Surgery and the Section on Neurology, The Mayo Clinic, Rochester, Minnesota. Read at the University of Minnesota Postgraduate Course for Continuation Study, Minneapolis, Minnesota, March 15, 1939.

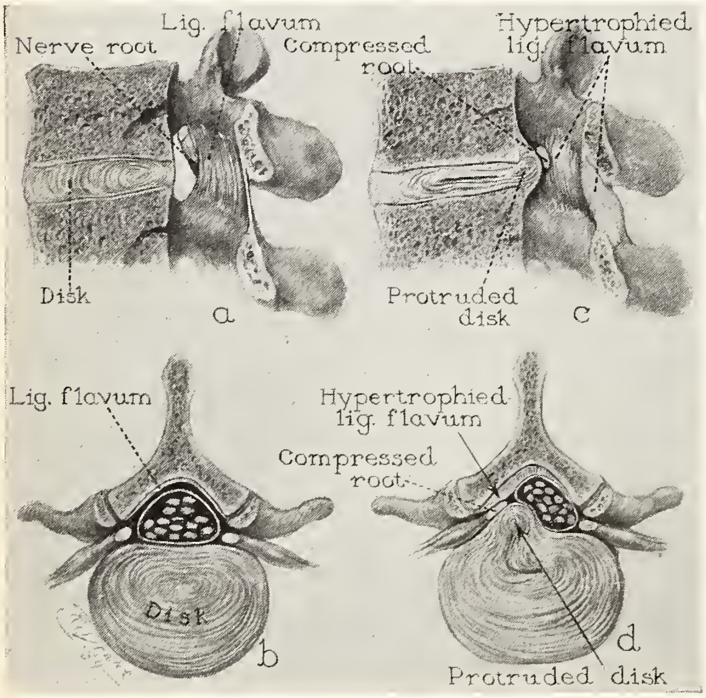

Fig. 1. Section of the vertebral column to show (a) and (b) normal relationship of intervertebral disk and ligamentum flavum to the nerve root and (c) and (d) the compressing effect on the nerve root of the protruded disk and the hypertrophied ligamentum flavum.

It is important to recognize that the trauma may injure several structures in the lower region of the back and that removal of only one of the sources of the pain will not completely relieve the patient. In this regard, it is interesting to note that hypertrophy of the ligamenta flava has been found in 155 of the last 175 cases of posterior protrusion of intervertebral disks (Fig. 1). Hypertrophy of the ligamenta flava in these cases is most likely due to the trauma that produced protrusion of a disk. It is obvious to us that simple removal of the hypertrophied ligamenta flava in these cases will not completely relieve the patient; therefore, it is the duty of the surgeon to search carefully for protrusion of a disk whenever hypertrophy of the ligamenta flava is found. Likewise, changes in the articular facets are sometimes encountered in cases of posterior protrusion of the intervertebral disks. Whether some of these changes in the facets are caused by the injuries that produced the protrusion of the disk or whether they are the result of the prolonged faulty posture produced by both the injury and the pain is difficult to state. The problem is complex and no one procedure is likely to be curative in all cases.

The role of tumors of the spinal cord and cauda equina in the production of this type of pain is well known. Similarly, metastatic tumors must always be thought of as causative factors. In this connection, a note of warning should be sounded. Tumors of the thoracic or even the cervical region of the spinal column may sometimes give rise to sciatic pain.

Infection and postural defects may produce pain in the lower part of the back and sciatic pain. The condition called "sciatic neuritis," alone or as a part of a multiple neuritis, is rarely found. Radiculitis of the cauda equina, which may be infectious in origin, has been similarly rare.

Although psychogenic factors certainly are not prominent in the causation of this type of pain, if indeed they may be said to cause it at all, in many cases they are important contributing factors. The physician who considers psychic factors unimportant and neglects to take them into account will do so to his sorrow, particularly in some cases involving workman's compensation. Surgical treatment is likely to have little effect on the pain of a patient afflicted with a traumatic neurosis, except to make it worse; unless, of course, the patient has a definite intraspinal lesion. Interpretation of results is difficult because of the persistent complaints of this type of patient.

A careful history should be obtained in every case of low back pain and sciatic pain, with special attention to the history of injury, to the type of pain, to whether the pain is recurrent or steady and to the presence or absence of muscular weakness, atrophy, paresthesia, loss of sensation and sphincteric difficulties. The characteristics of radicular or "root" pain are as follows: The pain is usually sharp and it may be burning or gnawing but it is rarely of an aching type. The pain tends to follow a segmental or radicular distribution but it may follow the course of the sciatic nerve or peroneal nerve. The pain often is aggravated by coughing, sneezing, straining, sharp flexion of the head on the chest. The pain tends to be worse at night; hence, a complaint of "night pain" always should be suggestive. In very severe pain of this type, the patient often finds that it is possible to obtain relief by walking, or sleeping in a chair.

The examination of a patient complaining of low back pain and sciatic pain should be thorough and detailed. Careful medical examination, supplemented by appropriate laboratory studies, is indispensable. Careful roentgenologic studies of the thoracic and lumbosacral regions of the spinal column and of the pelvis should be made. Orthopedic examination must not be omitted. Neurologic examination, with careful study of the tendon reflexes; of muscular strength; of muscular development, to detect the presence of atrophy; of sensation, including pain, temperature, touch, vibratory and joint or position sense; and of sphincteric tone should be made. The posture of the patient should be noted, as well as the appearance of a list, or obliteration of the normal lumbar lordosis and limitation of motion and the production of pain with spinal movements. The gait should be studied and any peculiarities noted.

It is apparent then that the underlying cause of low back pain and sciatic pain is quite frequently discovered during a comprehensive examination. A relatively moderate-sized group of patients suffering from sciatic pain need spinal puncture and examination of the cerebrospinal fluid to assist in making a diagnosis. In these cases spinal puncture is done in the prone position, usually at the fourth interspace, and the manometric pressure is taken both before, during and after compression on the jugular veins (Queckenstedt test) to determine the presence or absence of intraspinal pressure producing partial or complete subarachnoid block. The cell count of the cerebrospinal fluid is important in differentiating between inflammatory and other irritative lesions. The estimation of the total protein is important because in many irritative lesions the increase in total protein is the only indication.

Before determining definitely whether or not the underlying lesion causing sciatic pain is of such a nature that it will require an operation, it is sometimes advisable to carry out conservative therapeutic measures, consisting of rest in bed with extension, sacro-iliac belt, diathermy and epidural injection. We have observed that patients who, under conservative treatment, have an increase in pain with either extension or epidural injection usually have an intraspinal lesion requiring laminectomy for relief of their pain.

The symptoms of protrusion of the intervertebral disks into the spinal canal vary greatly but the chief symptom is root pain or a pain that begins within the spinal canal and is projected peripherally to that part of the body or extremity innervated by the nerve. The pain is often described as sharp and shooting and may be increased in severity by coughing, jarring or sneezing. It may be precipitated or increased by putting the nerve on tension, as by bending the neck or back. This is especially true in sciatic pain in which positive Kernig or Lasègue signs are elicited when the roots of the sciatic nerve are compressed by a protruded intervertebral disk. In testing for the presence of a protruded intervertebral disk as a cause of intractable sciatic pain, the Lasègue test is important and consists of flexing the thigh on the abdomen with flexion of the leg at the knee. If the leg is passively extended pain will be felt along the course of the nerve, inhibiting movement before complete extension of the leg is secured. This test may also be applied in the sitting position when the patient in attempting to extend the leg complains of an increase of pain in the affected leg preventing full extension of the knee. However, there are no pathognomonic symptoms of protruded intervertebral disk.

In the early reports of roentgenograms of the spine in cases of protruded intervertebral disk, it was thought that narrowing of the intervertebral space was of diagnostic significance, but the fact that narrowed intervertebral spaces are evident in cases in which no clinical signs of protruded intervertebral disk can be found makes it of little significance. Hypertrophic changes and compression fractures are also of little diagnostic value. The most important roentgenologic phase of the diagnosis of protruded intervertebral disks according to Camp is interpretation of the studies made after injection of radiopaque oil and in many clinics it is considered essential in making a preoperative diagnosis of this condition.

The introduction of air into the subarachnoid space of the lower lumbar and sacral portions of the spine has proved of value in localizing and diagnosing protruded intervertebral disks in some neurosurgical clinics, according to Fay and Pancoast. Because of the irritating effects of radiopaque oil and the simplicity of myelographic studies, we have recently been combining spinal puncture and spinograms. These procedures are carried out in the x-ray room with the patient lying on the fluoroscopic table. A lumbar puncture is made in the usual manner, manometric readings are obtained and 15 c.c. of fluid is removed for study. The table is then tilted to an angle of about 40 degrees and the fractional introduction of air is carried out. Between 30 and 40 c.c. of air is introduced, care being taken that the lumbar sac is emptied of fluid. Baker has suggested that shaking the pelvis or jolting the hips helps dislodge any fluid that would obscure the picture. Following the injection of air, stereoscopic anterior, posterior and lateral films are made. The evidence of narrowing of the lumbar canal or the protrusion of intervertebral disks is not so convincing as in roentgenograms taken after the injection of radiopaque oil but with practice the reading of the films becomes much easier.

In very heavy individuals, it may seem necessary to inject radiopaque oil and examine the patient under the fluoroscope as well as to make multiple roentgenograms in different positions. The use of radiopaque oil indiscriminately in all cases of persistent sciatic pain is not to be recommended and this test should be made a part of the general examination and be used only when the clinical examinations indicate it as a necessary part of the examination. Camp has emphasized the necessity of using sufficient radiopaque oil, 5 c.c., to fill the subarachnoid space at any desired level in order to visualize small nonobstructing lesions that can be identified by a filling defect. This defect assumes a characteristic shape, depending on whether the lesion is extradural, intradural or intramedullary.

In addition to the outline of the defect produced by the mass of the protruded disk, significant changes in the shadows of the nerve root may be present at the level of the lesion. These consist of edema of one or more nerve roots, which may be localized by broadening of the negative shadow of the nerve root. The surgeon sometimes has difficulty at the operating table in associating the pathologic picture found with the roentgenologic shadows, but Hampton and Robinson have offered a solution to this in calling attention to the fact that the fifth lumbar root and most of the first sacral root are extradural at the lumbosacral junction and for this reason a lesion compressing either of these roots may produce a minimal defect in a contiguous subarachnoid space.

Another associated condition that may contribute to the intractable sciatic pain and may or may not be associated with protruded intervertebral disk is a thickening of the ligamentum flavum, which was first emphasized by Towne and Reichert in 1931. The ligamentum flavum stretches across the posterolateral aspect of the spinal canal between the laminæ. The ligaments, which are made up of yellow elastic fibers, are attached to the anterior aspect of the inferior laminæ. The two ligaments of each interlaminar space fuse in the midline and extend laterally to form the posterior margin of the intervertebral foramina. The hypertrophy of this ligament, due to either inflammation or trauma, narrows the intervertebral canal and may constrict the nerves of the cauda equina or compress the nerve roots opposite the segment. It is evident, therefore, that in the presence of a protrusion of the intervertebral disk any hypertrophy of the ligamentum flavum would increase the symptoms proportionately. Since the original report of this condition, Spurling, Mayfield and Rogers have called attention to this pathologic condition, which can produce intractable pain and other associated clinical evidence of compression of the spinal nerve roots. In the roentgenologic examination following injection of radiopaque oil into the subarachnoid space, hypertrophy of the ligamentum flavum becomes evident in narrowing the canal and in some cases produces shadows, which, according to Camp, are pathognomonic. These lesions are mentioned in passing as contributing to the cause of intractable pain with or without the presence of protruded intervertebral disks because at the operating table these lesions are removed with the disks and relieve the pressure on the nerve roots.

At The Mayo Clinic, a study has just been completed of 300 patients on whom the existence of posterior protrusions of intervertebral disks was proved at operation. Of approximately 10,000 cases of low back pain and sciatic pain encountered at The Mayo Clinic in the past three years, only in these 300 was it possible to arrive at a diagnosis of probable protruded intervertebral disk. The protrusions tended to occur at the regions of greatest curvature of the spinal column. This appears to be indirect evidence of the traumatic nature of the protrusions, since it is in these portions of the spinal column that mechanical stress is greatest in heavy lifting or pushing. However, there was a total of only fifteen patients displaying protrusions in the cervical and thoracic regions of the spinal column, whereas there were 285 patients suffering from protrusions in the lumbar region. In 270 cases the protrusions were single, while in thirty cases multiple protrusions had occurred, two or more disks being definitely protruded. A total of 332 protrusions was found in the 300 cases. Of these, thirty had occurred at the third lumbar interspace, 140 at the fourth lumbar interspace and 139 at the fifth lumbar interspace.

There were 226 men among these patients and only seventy-four women. This difference of 152 probably is related to the greater liability of men to injury of the back. The average age at operation was forty years. One hundred and seventy-six patients (59 per cent) gave a history of injury; but in only 37 per cent of cases did the patient recall that the injury immediately preceded the onset of symptoms. One hundred twenty-four patients (41 per cent) could recall no injury, but many of these patients were engaged in occupations requiring heavy physical labor accompanied by much back strain. The injuries usually occurred as a result of heavy lifting or pushing, or from falling, particularly while carrying a heavy weight on the shoulder.

The large number of patients (81 per cent) reporting intermittence of symptoms is of great interest because intermittent symptoms constitute one of the most characteristic features of the syndrome. Whether, as Deucher and Love have recently suggested, it is due to edema of the protruded cartilage, or to withdrawal of the protruded portion into the body of the disk or to slipping of the nerve away from its point of compression cannot be stated definitely at this time.

Unilateral sciatic pain was the most common type of pain, bilateral sciatic pain occurring in 15 per cent of cases. Extension of the pain to other than the sciatic nerve was noted in only 3 per cent of cases and in only 5 per cent was there no back pain. Accentuation of the pain on coughing, sneezing, straining or flexing the head on the neck, occurred in 53 per cent of cases, while nocturnal pain occurred in only 21 per cent. Paresthesia, usually in the fourth or fifth lumbar or the sacral dermatomes, developed in 42 per cent of the cases of protrusion in the lumbar region.

The most important neurologic signs in cases of protruded intervertebral disk are Lasègue's sign, the presence of sciatic tenderness, and either diminution or absence of the Achilles tendon reflex. The hamstring reflexes may be either diminished or absent, and muscular weakness or atrophy or sensory loss may occur. In most cases obliteration of the normal lumbar curve was noted and movements of the back, particularly hyperextension, were limited and painful.

In the presence of positive neurologic findings, spinal puncture is indicated. This was done at The Mayo Clinic in 265 of the 285 cases in which protrusion was in the lumbar region. It was found that the only chemical determination of value in cases of protrusion of a lumbar disk was estimation of the concentration of total protein in the spinal fluid. The manometric readings, Queckenstedt's test, the flocculation test for syphilis, Nonne-Apelt test, Lange's gold-sol test and cell count were performed routinely on all spinal fluids but they gave no information of value. In 174 cases (or 66 per cent) the concentration of total protein was 40 mg. or more per 100 c.c. of spinal fluid, while in ninety-one cases (34 per cent) the total protein of the spinal fluid was below 40 mg. Thus, examination of the spinal fluid is of definite assistance in the diagnosis of protruded intervertebral disks; but a spinal fluid that appears to be normal does not exclude this condition.

In forty-two cases (15 per cent) of protrusions of lumbar disks neurologic examination gave objectively negative results except for the finding of a positive Lasègue's sign or sciatic tenderness or both, while in seventeen cases (6 per cent) neurologic examination gave completely negative results.

Contrast media, usually radiopaque oil, were used to localize accurately the intraspinal lesion in most of these cases. In thirty-two of the last 100 cases, however, it was felt so strongly that an intraspinal lesion was present in the lower lumbar region of the spinal column that laminectomy was carried out without the injection of a contrast medium. Since 96 per cent of the protrusions in the 300 cases occurred in the third, fourth or fifth lumbar space, the fourth and fifth having by far the largest proportion (84 per cent), direct exploration by laminectomy in the lower lumbar region should be possible and the chances of finding the lesion ought to be good. A word of warning should be given, however, since lesions in the lower thoracic region of the spinal column may give a clinical picture very similar to that of lesions involving the cauda equina, it will not usually be possible to dispense with the use of contrast media. In the rare cases in which the use of a contrast medium revealed no lesion (usually, it was found, because of the presence of a short cul-de-sac), a neurosurgeon and an orthopedist were both present at the laminectomy so that spinal fusion could be effected at once if results of the exploration were negative.

The treatment of intractable sciatic pain due to protruded intervertebral disk compressing the nerves or nerve roots is surgical in all cases. Temporary and palliative relief may be obtained by conservative orthopedic treatment such as extension, support by means of braces and sacroiliac belts, and fusion, but unfortunately the relief is only temporary and the irritation of the nerve roots recurs.

It is conceivable that in some cases facetectomy, as suggested by Ghormley, would decrease the irritation of the nerve root and result in relief. However, the tendency of the protruded disk to increase in size and the possibility of some hypertrophy of the overlying ligamentum flavum indicate that the treatment of choice consists of laminectomy with removal of the protruded disk.

The lesion having been localized by means of fluoroscopic examination and subsequent roentgenograms with air or radiopaque oil, small laminectomy involving two spines and laminæ is all that is necessary in the majority of cases. The anesthetic of choice is ether, and this is best administered by the open-drop method over the end of a Magill intratracheal tube, which has been introduced after the patient has been anesthetized by nitrous oxide and oxygen. After the patient has been anesthetized he is placed prone on the operating table in such a manner that the prominence of the lumbar and sacral spinous processes is increased. Through a vertical incision a subperiosteal resection of the spinous processes and laminæ is done. The extent of the laminectomy depends a great deal on the location of the protrusion of the disk. In cases where the protrusion is unilateral it may be necessary to remove the articulating facets on that side. The protruded disk may be removed extradurally or transdurally and again it depends a great deal on the ease of exposure whether the dura is retracted to expose the protruded disk or is incised and the disk approached intradurally. The protrusion of the disk can be palpated and the exposure carried out as indicated. When the protrusion has been exposed by retracting the dura mater the thinned-out posterior longitudinal ligament is incised either longitudinally or by means of a crucial incision.

The protrusions may be of two kinds in that the posterior longitudinal ligament may be so thin that the protruded disk pops into the wound or, the disk being fibrous and adherent, it may have to be curetted from its bed. All portions of the intervertebral disk that are causing or could cause pressure on the nerve roots or spinal cord should be removed. One of the outstanding features at the operating table is the evidence of irritation on the adjacent nerve roots. These are increased in size and edematous and sometimes are injected, showing that the intractable pain has been caused by irritation by the protruded disk. Following removal of the disk, the radiopaque oil is removed and the wound is closed, usually a Penrose drain being left in place from twenty-four to forty-eight hours. Patients are kept in bed following operation from ten to fourteen days and if voluntary urination does not occur by the third day an inlying urethral catheter is placed for continuous drainage.

The postoperative results in all cases of intractable sciatic pain have been most gratifying. It also is gratifying that there have been no deaths in the entire series. In the literature there are reports of operative cases of protruded intervertebral disk in which fusion has been necessary to relieve subsequent postoperative pain. In none of our cases has this been true.

Comment

Intractable low back pain and sciatic pain that is persistent but intermittent and does not respond satisfactorily to any type of treatment should be suspected as being due to protruded intervertebral disks. In a large percentage of these cases a careful and complete examination will elicit certain evidences of underlying pathologic factors, although it may be necessary to localize and identify the lesion by means of radiologic examinations following the injection of air or radiopaque oil within the subarachnoid space. The presence of increased protein in the cerebrospinal fluid and the positive Lasègue's sign, changes in reflexes and tenderness in the sciatic nerve are helpful, although not essential in making a diagnosis.

The treatment of choice is laminectomy with removal of the protruded intervertebral disk as well as a possible associated hypertrophied ligamentum flavum.

Postoperatively, the patient should be cautioned not to return to work too soon and for a long time no heavy labor should be attempted. The mortality is so comparatively low that it is almost negligible when the fact is taken into account that a group of patients suffering from intractable sciatic pain due to protruded intervertebral disks are permanently relieved of their pain and disability.

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SCATTERED RADIATION AND VARIATION OF ROENTGEN OUTPUT OF X-RAY GENERATORS IN PRACTICE[*]

WILHELM STENSTROM, Ph.D., and IRWIN VIGNESS, Ph.D.
Minneapolis, Minnesota

IN THE course of calibrating x-ray generators in Minnesota and the Dakotas, it has been noted that the arrangement of these generators as encountered in practice is subject to criticism in regard to the safety precautions taken. This is particularly true for the superficial machines. If a comparison is made of installations used for superficial therapy (up to 140 Kv.P.) and installations used for deep therapy (over 140 Kv.P.), it will show that much less care is taken in protective factors for the lower voltage generators than the lower voltage would justify. This is perhaps due in a large measure to a lack of information at the time of installation by those owning these machines. A number of these machines were installed before methods of protection had been standardized.

About half of the superficial generators, whose calibrations will be given, represent the initial calibrations of these machines, although they may have been in operation for many years. Most of the machines have been calibrated but once, and several years may have elapsed since the initial calibration. It is recommended that the machine be calibrated at least once a year and following any change of tube or adjustment in the electrical circuit.

Protection to the Operator

The purpose here is not to repeat the recommendations offered by various organizations[3,5] concerning x-ray and electrical protection, but to point out conditions that exist in practice. Some of the more important and immediately necessary improvements will be given; however,

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[*] From the Department of Radiology and the Cancer Institute, University of Minnesota Medical School, Minneapolis, Minnesota.

TABLE I

Generator		Radiation Intensity Near Control Stand
Kv.P.	Ma	
220	15	0.0000 r/min.
200	30	0.0000
200	30	0.0004
200	20	0.0020
135	5	0.008
120	5	0.021
100	5	0.000
100	5	0.017
100	5	0.005
100	5	0.022
100	3	0.017
100	5	0.020
80	5	0.010

As 0.1 roentgen per day is considered the maximum safe daily dose for a person working with x-rays, a machine used five hours per day is considered unsafe if the exposure exceeds 0.0003 r/min.

these should not be considered sufficient, or to replace the recommendations offered above.

X-ray radiations were measured with a Victoreen roentgen meter. A large ionization chamber used with this meter was employed to measure the intensity of radiation at a position near the control stand. The chamber was left in this location during most of the time the x-ray generator was being calibrated. Thus, the intensity of radiation is not that for any given filtration of the primary x-ray beam but some value that is an average for the different filters used. This intensity of radiation near the control stand will be greater if there is no filtration of the primary x-ray beam and will be less if the primary beam is heavily filtered. For no filtration the intensity of radiation near the control stand will be slightly greater than the values given in Table I, and for three or four millimeters of aluminum filtration, for the superficial machines, the values will be slightly less.

Table I shows the intensity of radiation at or near the control stand for different generators. These data are for the conditions encountered in practice.

It is noticed at once that a much greater than proportionate respect is given to the protection from hard x-rays than from the soft. Some justification for this may be given when one realizes that the low voltage machines are operated a much smaller fraction of the time than are the high voltage generators. Some of the superficial generators will not average more than ten or fifteen-minute operation per day, though others may operate for an hour or so. The deep therapy machines operate from one to eight hours per day.

Without exception the superficial x-ray tubes included in the tabulation were housed in open lead glass bowls. All were air cooled universal type Coolidge tubes. In the cases where the intensity of radiation at the control stand was more than 0.01 roentgen per minute, the control stand was located in the same room as was the x-ray generator. In some cases the control stand supported a thick plate glass behind which the operator stood. This glass and the control stand offered a measure of protection from the direct radiation but gave little protection from the scattered radiation.

Most economical shielding will be obtained by stopping the x-rays close to their source. The use of a closed lead glass bowl, or a shock proof assembly, to house the x-ray tube is strongly recommended. This should remove an enormous amount of non-useful radiation, the source of much of the scattered radiation. It must be remembered that a considerable amount of scattered radiation will arise from the useful beam of x-rays, and direct and scattered radiation will originate from x-rays penetrating the arms of the x-ray tube and perhaps the lead glass bowl. Hence, this protection will not be sufficient for an operator of a machine with its control stand in the same room as the x-ray generator, if the generator is in operation more than fifteen to twenty minutes per day. If the control stand cannot be removed from the x-ray room, it should be enclosed in a booth lined with lead or another material having a minimum thickness equivalent to 1.5 to 2.5 mm. of lead for voltage from 100 Kv.P. to 150 Kv.P. Lead glass windows should be used for observation.

Too much cannot be said in favor of the completely enclosed shock-proof x-ray apparatus such as is now available for both therapy and diagnostic units. The electrical hazard is, in most cases, entirely eliminated, and the amount of non-useful x-rays penetrating the tube housing is reduced to a practical minimum, though in many cases not to a negligible amount.

In fluoroscopy and radiography, where the x-ray tube is behind a table or stand, extreme precautions should be taken to ground suitably and permanently all metal parts of this table or stand. All metal parts of x-ray apparatus, such

TABLE II

Generator	100 KVP			12 in. TSD		
	No filter			1 mm. Al. filter		
	Roentgens per ma. per min.	Per cent roentgen output	Half value layer mm. Al.	Roentgens per ma. per min.	Per cent roentgen output	Half value layer mm. Al.
1	18.2	100	0.6	7.0	100	1.6
2	22.0	121	0.9	10.2	146	1.8
3	23.5	129	1.0	12.0	172	2.0
4	24.0	132	0.8	10.4	148	1.8
5	26.9	148		10.8	154	
6	28.0	154	0.5	8.8	126	1.8
7	28.2	155	0.8	13.0	186	2.0
8	28.8	158	0.8	11.7	167	1.7
9	30.2	164	0.5	10.1	144	1.8
10	34.6	190	0.5	11.2	160	
11	37.4	205	0.5	9.4	134	1.3
12	42.8	235		12.6	180	
13	45.6	251	0.5	15.1	216	1.5

as control stands, transformers, motors, and tube stands should be grounded. The rheophores (reels upon which wind the flexible conductors to tube terminals) should be kept in good condition so that slack is not allowed to be present in the flexible conductors between the rheophores and the tube terminals. The amount of slack in these conductors and the lack of ground on a fluoroscopy table caused the death of a North Dakota physician about two years ago.

When a patient is placed between exposed high tension and a table or stand, such as is the case in roentgen therapy for most superficial machines, the table or stand should be made of insulating material, like dry wood, and insulated from ground so that the patient will not form a conducting path between the high voltage and the ground.

The hazard of too much exposure to the physician during fluoroscopy, particularly to the hands, is a special problem that has been discussed by others. Cilley, Leddy, and Kirklin[1] stress the importance of speed, the use of the protective power of barium-filled parts of the body when possible, and limitation of the x-ray beam to small dimensions. Jaeger and Stubbe[2] point out that a dose of 100 r will double or treble the spontaneous mutation rate of the "Drosophila melanogaster" (fruit fly), and that these radiation effects are cumulative and irreversible.

Output of Superficial X-ray Generators

Nurnberger[4] has reported on the output of different x-ray generators. He has shown a variation in roentgen output per milliampere at a given distance of about 80 per cent for 100 Kv.P. generators. Table II shows still greater variations and emphasizes still more strongly the necessity for the calibration of superficial machines.

TABLE III

	100 KVP	5 ma	12 in. TSD	
Tube	No filter		1 mm. Al. filter	
	Roentgens per minute	Per cent roentgen output	Roentgens per minute	Per cent roentgen output
1	85	100	40	100
2	121	142	45	112
3	155	182	46	115

The variation in output of over 150 per cent for unfiltered radiation and of over 100 per cent for filtered radiation shows the extreme necessity of using the output measured in roentgens as a measure of the x-ray dose rather than such factors as milliampere-minutes at a given voltage.

There are many causes for the variation in output for different x-ray generators operating at the same peak voltage and effective currents. Different tubes may cause considerable variation, especially for unfiltered values of radiation. Table III gives the output of three different x-ray tubes, all operated from the same high voltage equipment and placed in the same lead glass bowl during operation.

The x-ray tubes used were all old, air cooled, Coolidge tubes, of various types encountered in practice. It is interesting to observe, in this case using different x-ray tubes on the same high voltage system, that the roentgen output of the filtered radiation for the different tubes is quite similar, although there is very great divergence in their unfiltered output. This is due mainly to differences in the wall thicknesses of the glass and pitting of the target, which becomes less important as the x-ray beam becomes more heavily filtered.

Table III shows that different x-ray tubes will cause a change in roentgen output when used under identical conditions. Table II further indicates, from the large variation in filtered radiation, that different high voltage generating systems, even of the same type, cause large variation in the roentgen output. This is not surprising, for it is well known that the x-ray output is quite sensitive to such things as small shifts in phase of a mechanical rectifier. The spark gap distance of this kind of rectifier is important. The wave form of the applied high voltage is affected by the x-ray transformer used and the power supply, which in turn affect the x-ray beam.

The variations of the same machines after repeated calibrations, separated by long intervals of time, will be given after more data have been collected.

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MEDICAL-LEGAL ASPECTS OF HOSPITAL AND MEDICAL RECORDS*

JULIAN F. DuBOIS, M.D.

Secretary, Minnesota State Board of Medical Examiners
Saint Paul, Minnesota

THE subject assigned to me by your program committee is rather difficult of presentation because of its dual nature, being a combination of problems in medicine and in the field of law. However, I shall at least try to give you a medical view of the problem and a few legal references. The subject is much too comprehensive to be fully covered in a paper such as this and in the time available. I hope to cover a point or two that may prove of value in our common endeavor.

The practice of medicine and surgery and the operation of a hospital in this day and age makes the preparation of medical and hospital records and their preservation, an absolute necessity. The purpose of so doing is two-fold: (1) to insure proper, adequate and timely care to the patient; (2) to protect those furnishing that care, including the hospital, from imposition and litigation. All of us know that the welfare and in some cases, the very life of the patient, depends on the records that have been kept. Medication and surgery both depend in a large measure on the previous history of the patient, on the amount and kind of medicine and therapy previously used and on the tolerance of the patient therefor. In addition, it is a pathetic sight to witness in court the attempted defense of a physician or hospital, charged with malpractice or a criminal act, when the records are either inadequate or not available.

The law is well settled that a lawsuit may be maintained against an attending physician for malpractice. However, the Supreme Court of Minnesota has stated that a physician *is not an insurer of a cure nor of a good result from treatment or an operation. He is required to possess skill and learning possessed by average members of his profession in good standing in his locality and to apply that skill and learning in the instant case with due care.*

It is also the law that a suit may be maintained against a hospital for negligence on the part of its employes and agents. This includes nurses and others who are employed by the hospital. When we consider these facts the importance of records is more firmly impressed upon us.

For the purposes of this paper I wish to classify medical and hospital records as follows: (1) those to be prepared and kept by the attending physician; (2) those to be prepared and kept by the hospital. Because of the dependance of one upon the other, the physician is interested in those made in the hospital and the hospital is interested in those made by the physician. There are almost as many types of medical records as there are physicians. It is not the type or form of record that matters, but rather what it contains or omits. Every physician should make and keep *a written record of every case he attends.* This means office cases, home cases, and *hospital cases.* A good medical record is written in ink. It is made out at the time of examination and treatment. It shows the various dates *including the year.* It has a personal history of the patient, such as his age, sex, race, occupation. Time and place of the accident causing injuries complained of or the on-set of the illness. It contains enough of the symptoms to justify and warrant the diagnosis, which should also appear on the record; the treatment prescribed and *anything unusual about the case in any manner* should be noted on the record. The record should briefly contain a previous history from a medical and hospital standpoint. It should contain the address of the patient at the time of treatment or examination, as the case may be; the patient's marital status, physical findings, laboratory results, etc.

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When the attending physician has prepared and preserved such a record, its value to a hospital, in the event of hospitalization and the raising of any subsequent question in or out of court, with respect to the treatment or hospital care is readily appreciated.

From the moment a patient enters a hospital there should be made and preserved a complete written record of the case. This so-called hospital record can perhaps best be divided into an office record, containing an identification of the patient and the business transactions from a financial standpoint; a careful social history; a case history including a daily record of the progress of the patient. This should show each procedure in the care of the case and the authorization for the same. This includes physical findings, laboratory findings, x-ray, diet and *anything unusual about either the case, the patient or the treatment,* consultations and in extreme cases consultations with members of patient's immediate family.

These records should be preserved—not until the bill is paid—but indefinitely. Under the laws of Minnesota a physician and a hospital has, in the ordinary case, six years in which to collect for services rendered. Malpractice suits must be brought within two years of the alleged malpractice except in the case of: (1) patients under twenty-one years of age; (2) insane patients; (3) imprisonment of patient on a criminal charge. There are two other exceptions that are not necessary to consider here. This means that in the three groups above mentioned, the records must be preserved until the disability to bring suit is removed. It will thus be seen that furnishing hospital care to a child of ten years includes the responsibility of preserving those records until after the child is twenty-one years of age.

The courts have held that a physician's medical record of a case belong to him *and not the patient.* So likewise, hospital records belong to the hospital and should be preserved by the hospital. Keep the various records in a given case separate, so that a patient may be shown his daily progress record, if he so desires, without burdening him with all the other details, some of which are confidential and privileged. The contents of these records should not be discussed nor disclosed to anyone except the attending physician *without the written consent of the patient.* To do otherwise involves serious legal responsibility. A hospital can be required to produce case records in court but only by subpœna or court order. It is then customary for some proper person from the hospital to produce the records in court. At the conclusion of the trial or the hearing they should be *returned to the hospital.*

No person in the employ of a physician or a hospital should volunteer information about a patient. To do so is unlawful, unethical and in many cases productive of injustice. In addition, suit can be brought against such person.

One of the things that I would like to mention is the very bad practice of permitting correspondence and privileged communications to be placed in with the hospital records. Perhaps a specific case that occurred here in Minnesota will best demonstrate the point. During the time that this particular patient was hospitalized, a discussion took place relative to the necessity and advisability of a surgical operation. A letter was written on the stationery of the hospital and signed by the physician in charge of the case, addressed to the family physician making inquiry about the previous medical history of the patient. The family physician promptly responded and gave what he thought was a frank summary of the situation. The family physician assumed that the contents would be kept in the strictest of confidence, and, of course, under the law, the letter is a privileged communication. Despite this fact, the letter was carelessly permitted to be placed in with the hospital chart and was read by the patient. The net result is a law suit on the horizon and the loss of a patient by a physician who thought that he was doing everyone a service, including the patient. Such a situation is very easily avoided, and, of course, there isn't any justification whatever for permitting such a letter to be placed in with the hospital chart.

Upon the question of x-ray negatives, the Supreme Court of Michigan in a case decided on September 9, 1935, held that the x-ray negatives are as much a part of the history of the case as any other case record made by a physician or surgeon. The court stated that the retention of the x-ray negatives by the physician and surgeon constitutes an important part of his clinical record in a particular case. I quote from that decision of the Supreme Court of Michigan:

> "Further, plaintiff was fully justified in refusing to surrender possession of the x-ray negatives. In the absence of agreement to the contrary, such negatives are the property of the physician or surgeon who has made them incident to treating a patient. It is a matter of common knowledge that x-ray negatives are practically meaningless to the ordinary layman. But their retention by the physician or surgeon constitutes an important part of his clinical record in the particular case, and in the aggregate these negatives may embody and preserve much of value incident to a physician's or surgeon's experience. They are as much a part of the history of the case as any other case record made by a physician or surgeon. In a sense they differ little if at all from microscopic slides of tissue made in the course of diagnosis or treating a patient, but it would hardly be claimed that such slides were the property of the patient. Also, in the event of a malpractice suit against a physician or surgeon, the x-ray negatives which he has caused to be taken and preserved incident to treating the patient might often constitute the unimpeachable evidence which would fully justify the treatment of which the patient was complaining. In the absence of an agreement to the contrary, there is every good reason for holding that x-rays are the property of the physician or surgeon rather than of the patient or party who employed such physician or surgeon, notwithstanding the cost of taking the x-rays was charged to the patient or to the one who engaged the physician or surgeon as a part of the professional service rendered."

McGarry *vs.* J. A. Mercier Co.
272 Mich. 501, 262 N. W. 296

Other Supreme Court decisions indicate the necessity and wisdom of making particular notations in respect to certain procedures. For instance, in a law suit based on alleged malpractice where the death of a patient followed the giving of an anesthetic, it is extremely important in the defense of such a case that the records show the kind of anesthesia used and the amount, as well as the person who actually gave the anesthetic. Similar care should be exercised in the preparation and preservation of records in cases where narcotics are administered; where serums of various types are used; in cases where drains are inserted; and in cases where heating appliances are used. In this connection it might be added that there have been numerous law suits over postoperative burns, and it will be seen that it is most important that the records show the type of hearing appliance used, as well as the length of time for which it was used.

As I stated at the outset of this paper, it is neither possible, nor practical, to enumerate all of the essentials with respect to the making and preservation of such records. In the time allotted me I have attempted to set forth a few essentials, and if I were to summarize the matter, I would simply state: (1) make a permanent record at the time of examination, treatment or hospitalization; (2) have the record sufficiently in detail so that it will be of value if you are ever called upon to use it; (3) preserve the record indefinitely.

230 Lowry Medical Arts Building.

On one point there is no longer debate. The need of medical and social supervision for arrested cases of tuberculosis over a prolonged period is clearly indicated. It is the only insurance against failure regardless of whatever procedure is adopted in the individual case.—National Tuberculosis Association, Annual Report, 1938.

FRACTURE OF THE NECK OF THE FEMUR

F. S. WARREN, M.D.
Washington, D. C.

IT IS not many years since treatment of fracture of the neck of the femur gave but a forlorn hope of bony union and a good serviceable limb.

This fracture in adults usually occurs in individuals over the age of fifty. In those over seventy it constitutes 70 per cent of all fractures. It is more common in women. Atrophy of the bones, or osteoporosis, which occurs in all elderly people, may be a cause. It is of little consequence in fracture of the neck of the femur whether it be intracapsular or extracapsular.

In considering the proper treatment of these fractures the anatomy and relations of certain structures is of most importance. The neck of the femur extends inward, upward and slightly forward, being set upon the shaft at an angle of about 125°; it is expanded at its base where it meets the shaft obliquely, compressed from before back so that its vertical diameter greatly exceeds its antero-posterior diameter. It is shorter above and in front than below and behind. The head forms more than half a sphere and behind and below its central point is a small oval depression which gives attachment to the ligamentum teres, and in this depression are one or two small vascular foramina. The great trochanter is prolonged upwards in a line with the external surface of the shaft. The small trochanter, a pyramidal eminence, projects from the posterior and inner aspect of the bone at the junction of neck and shaft. The anterior intertrochanteric line separates the neck and shaft anteriorly and indicates the attachment of the capsule of the hip joint as does the posterior intertrochanteric line posteriorly. The capsular ligament surrounding the joint is attached above and behind to the margin of the cotyloid cavity outside the attachment of the cotyloid ligament and to the outer surface of the cotyloid and transverse ligaments in front and below. The femoral attachment anteriorly is to the anterior intertrochanteric line and root of the great trochanter, and posteriorly to the middle and external thirds of the neck to within one-half an inch of the posterior intertrochanteric line. The muscles about the joint most concerned with the fracture are two groups: (1) that involved in forcing soft tissues between the fragments; (2) the group concerned in causing displacement of fragments. The first is the ilio-psoas muscle; the second group includes the external rotators of the thigh and those causing shortening by their contraction. It should be noted that the ilio-psoas muscle passes down over the brim of the pelvis across the anterior surface of the neck of the femur, where there is a bursa between it and the capsule of the joint, and is inserted into and immediately below the small trochanter.

With both an upward displacement and an external rotation of the distal fragment, there is a wide space between fragments into which the contracting ilio-psoas forces its own mass and underlying tissue.

When this fracture is treated by using simple longitudinal extension with various splints, or by applying plaster casts with the thigh held at various angles, the statistics show bony union with a good useful extremity in from 18 to 26 per cent of cases. The reason for such poor results rests on two factors: (1) interposing soft tissues have not been removed from between the fragments; (2) proper traction to overcome *both* shortening and external rotation has not been provided and the fracture surfaces have not been held in correct apposition. Low blood supply or poor nutrition of the bone may possibly be a cause in some very few cases where there is considerable stripping off of the periosteum, but where there is failure of bony union it is due to the two factors, interposition of soft tissues and incorrect position of fragments.

The symptoms of fracture of the neck of the femur are: complete loss of function; external rotation of the leg and thigh; shortening due to the fracture and muscle contraction; crepitation upon moving the parts; pain upon passive motion or upon making pressure over the great trochanter or joint.

The Ruth Maxwell method of treatment has given complete success, with bony union and good serviceable limbs in ten successive cases in the author's experience.

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*Read at the meeting of the St. Lucas Hospital Staff, November 11, 1938, Faribault, Minnesota.

Following is a description of the Ruth Maxwell method of reduction and the use of double tractions: First, assemble material and appliances to be used. If in a private home an iron bed should be used if possible. Place three or four boards or slats across the bed beneath the springs to prevent sagging. Have two pulleys supported on steel rods to be clamped to the bed, one at the foot and the other at the side. Provide three blocks to be used in blocking up the bed at the foot and one side. These should be sixteen, twelve and six inches high respectively. Provide material for Buck's extension. Make a pad containing yucca splint material or other stiffening, about a foot square, and a broad band to pass around the thigh to which the rope for lateral traction will be attached. Have an anesthetist, assistant, and two nurses present. Use a general anesthetic. When the muscles are relaxed the assistant, standing near the bed, on the fracture side, passes his hand under and to the inner side of the thigh. The operator grasps the leg immediately below the knee, flexing it as he raises it, and flexes the thigh on the abdomen. This fully relaxes the ilio-psoas muscle. The assistant makes traction laterally, which drags on the soft tissues in that direction and thus lifts them from between the fragments. The operator rotates the femur internally on its long axis while at the same time the assistant lifts on the great trochanter with his free hand. The operator extends the thigh and leg down into the extended position and a nurse immediately grasps the foot by the dorsum and heel, making traction and keeping the foot perpendicular until Buck's extension, with the weights, is applied. Meanwhile the assistant will continue making lateral traction until the padded splint is applied to the inner side of the thigh and the broad band carried over it is attached to the rope which is to be run over the pulley at the side of the bed for lateral traction. This pulley is held by a steel rod clamped to the side of the bed opposite the crest of the ilium and about twenty inches above the surface of the mattress. The Buck's extension makes longitudinal traction, overcoming the shortening, while the lateral traction, rotating the thigh inwards, to overcome external rotation, lifts the great trochanter so as to assist in holding it and the distal fragment of the neck in normal position. The resultant of the two lines of traction is in direct line with the long axis of the fractured neck.

A flattened pillow should be placed under the thigh and leg so as to elevate them slightly and keep the heel from resting on the bed. A long sand bag is placed along the outer side of the thigh and leg extending beyond the foot, and a shorter sand bag is placed along the inner side. These guard against rotation. The extension weights will vary according to the weight and muscular development of the patient, the weight for the lateral extension being about two-thirds that of the longitudinal extension. After the first three days the muscles become relaxed and the weights can be made less from that time on. For counter traction and to keep the patient from sliding towards the pulleys the bed must be tipped by blocking at the foot and side. For example, if the fracture be on the right side, the right foot bed post will be blocked up sixteen inches from the floor, the left foot bed post twelve inches, the right head bed post six inches and the left head bed post will rest on the floor. This will tip the bed away from the traction weights. Give instructions to the attending nurse to see that the foot is always kept in a vertical position. Measure the distance between the anterior superior spine of the ilium and the internal maleolus and compare with the well side. With the foot in the vertical position and the measurements the same on both sides it will be known that the fractured surfaces are in correct apposition. Keep the heel free from pressure and do not allow the patient to slip down in bed so that the spreader to which the rope is attached contacts with the pulley. The patient can be pulled up in bed by placing the hands in the axillæ. There will be no difficulty in using the bed pan; the patient can lift the hips by using the well leg. After the second or third day the back rest can be raised and the position of the patient changed. In doing this, the pelvis is simply turned on the head of the femur with no displacement or movement of the fragments.

No other methods that I have seen used in the treatment of these fractures have produced results so constantly successful as the Ruth Maxwell double traction method with the proper reduction of the fracture. Removing soft tissues from between the fragments before applying traction is most necessary for success.

In my series of ten patients, all were over fifty-five years of age. The oldest was a woman in her ninety-fifth year. She had bony union and perfect results. A few months after her recovery a member of the family complained that she too frequently wandered away from home by herself.

Most of the text books mention impacted fractures. I question their occurrence. Most of these fractures of the neck of the femur are caused by a slight fall or mis-step. It would require a heavy blow to fracture the bone and at the same time drive one fragment into another so as to impact them and peg them together. Partial, or green-stick fractures, are not impacted fractures. Where the characteristic symptoms of complete external rotation and shortening were present I should always anesthetize the patient, reduce the dislocation as described, and use the Ruth Maxwell method of double extension.

Danger of hypostasis will be eliminated, even in very old patients, by using the back-rest and changing its position at intervals.

Summary

Success in obtaining bony union depends upon the removal of soft tissues from between the fragments and retaining their apposition.

The weights used for extension and the amount of the tipping of the bed depend upon the weight and the musculature of the patient.

This method, properly applied, renders the use of plaster casts and radical open operations, with the use of nails and pegs, unnecessary. During no other form of treatment will the patient be kept as comfortable, nor does any other method assure as great certainty of success.

ACUTE MESENTERIC ARTERIAL THROMBOSIS*

WARNER OGDEN, M.D., F.A.C.S.
Saint Paul, Minnesota

ACUTE mesenteric arterial thrombosis presents one of the most dramatic intra-abdominal catastrophes encountered in surgery. The symptoms are severe and ominous, the patient becomes steadily worse, and an accurate diagnosis seems often impossible.

History.—Mesenteric thrombosis was first reported by Hodgson at Guy's Hospital in London in 1815, and again three years later by Chaussier. Tiedman was the first to describe the disease in detail in 1843, and Virchow studied and reported the morbid anatomy in 1847. In 1913 Trotter published his Cambridge monograph assembling all literature from 1847, 360 cases including his own.

Incidence.—Since 1923 there have been but thirteen cases at Johns Hopkins Hospital; in 300,000 admissions at the Charity Hospital, New Orleans, only thirteen cases; in 30,000 admissions at the Emergency Hospital, Washington, D. C., seven cases; at the Boston City Hospital in thirty-three years, but fifty-one cases; and at the Miller Hospital, Saint Paul, in 61,000 admissions, but five cases and three of these secondary to operation.

Etiology.—Captain S. W. Mathews in "The Military Surgeon" for March, 1937, discusses the various causes of mesenteric thrombosis. Two-thirds of the cases he has studied afford suggestions as to etiology, the chief factors seeming to be arteriosclerosis, some pathological state of the gastro-intestinal tract, or some preceding operation. Also, distention of the gut slows circulation in the walls and this may be a precipitating factor. Thrombosis may occur after a blow on the abdomen, or after great straining on exertion. It may follow various acute abdominal inflammations, either surgical or non-surgical. Often a combination of two factors is necessary to produce the condition. One of the most common causes and the one present in the case to be reported is arteriosclerosis; and the accompanying thrombosis is the same that may occur anywhere, as in the coronary, cerebral, or femoral arteries, which is simply the sudden dramatic culmination of a slowly progressive arterial degeneration.

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*Read before the St. Paul Surgical Society, October 13, 1938.

Pathology.—In 90 per cent of the cases the thrombosis occurs in the superior mesenteric vessels, 61 per cent being in the artery. Arteriosclerosis is common in the mesenteric arteries, and we may have thrombosis of small branches without serious results and without a proper diagnosis being reached. The superior mesenteric artery is not a true end artery, but occlusion of it usually produces the same result as though it were an end artery. Occasionally we may have enough collateral circulation to maintain nutrition of the gut if the main vessel is not involved, but not enough to maintain peristalsis. In such cases we get intestinal obstruction but not gangrene. But occlusion of the main trunk of the superior mesenteric artery results in so violent a spasm of the bowel and so much edema that it becomes isolated from the neighboring rich collateral circulation and complete gangrene ensues.

Loop gives an excellent description of the appearance of mesenteric thrombosis at operation. "Transparent sticky peritoneal fluid, amber or blood-tinged, and without coagulated lymph. Cyanosed plum colored soggy edematous intestine with glistening peritoneum, free from adhesions, its lumen relaxed (not distended) to a large calibre, lying inert in the abdominal cavity with no tendency to crowd out of the incision, held down by the weight of the fluid within its lumen, containing very little gas."

In a typical autopsy specimen the thrombus may be seen at the point where the superior mesenteric artery branches off from the aorta, lightly adherent to a roughened intima of the artery and having piled up at the bifurcation as the flood waters of a stream pile up debris at the upper end of an island until the channel is dammed.

Symptoms.—The past history may give suggestions as to the etiology or diagnosis. The presence of arteriosclerosis or gastro-intestinal tract pathology is important. The history of attacks of true abdominal angina pain may long precede a mesenteric thrombosis, even as a history of angina pectoris may long precede a coronary thrombosis.

The immediate symptoms are first pain, sudden and severe, in frequent paroxysms of greater and greater intensity. This pain is worst at the seat of the lesion, and there may be tenderness near the umbilicus. There may also be reflex vomiting at this time. As this pain subsides or is relieved by opiates, there may be a complete absence of physical findings, the abdomen being soft with no localized or definite tenderness, or at least much less rigidity and tenderness than the pain would indicate. There are signs of shock at first, not necessarily severe. There is no distension and no sound of peristalsis as heard in intestinal obstruction.

The symptoms then slowly change as the process progresses into the second stage of intestinal stasis and then gangrene. We now get distension, a temperature up to 102°, a leukocytosis from 12,000 to 40,000, and later vomiting becoming gradually bloody or fecal in type. Perhaps a bloody diarrhea ensues, and eventually all the symptoms and signs of a rapidly spreading and fatal peritonitis.

Complete thrombosis of the superior mesenteric artery causes a gangrene of most of the ileum, the cecum and the ascending colon, and if one keeps the picture in mind of this obstructive gangrene, slowly following the pain and shock due to the occlusion of a major artery, the symptoms are easily understood.

Differential Diagnosis. — Acute pancreatitis may be accompanied by a similar pain but there is not an initial absence of all physical, followed later by the development of typical, signs of peritonitis and obstruction. The previous history and the possible slight jaundice in acute pancreatitis may be significant.

Acute perforated peptic ulcer produces marked rigidity at first; mesenteric thrombosis none. Also in perforated ulcer the vomiting if any is not as persistent or profuse as in the later stages of mesenteric thrombosis.

Intestinal obstruction is accompanied by distension and increase in peristaltic sounds.

Acute appendicitis followed by peritonitis may be confused, but the typical history is different, there is no blood in the stomach or stool and the condition of the patient does not deteriorate with such hopeless rapidity.

Treatment.—The only treatment is resection or exteriorization of the gangrenous intestine. It is stated that 33 to 50 per cent of the ileum can be removed without being necessarily fatal.

Prognosis.—The outlook is serious as the mortality of this condition is 85 to 100 per cent.

Case Report

The case I wish to present is of especial interest because it perfectly illustrates, in history, progress, and pathological findings, the typical story of acute mesenteric arterial thrombosis of arteriosclerotic origin.

The patient was a man of sixty-six, well developed and nourished, and previous to the onset of the last illness of healthy appearance.

Past History.—About four years previous he had gradually developed dyspnea and palpitation and was found to have auricular fibrillation. He also had symptoms suggestiong duodenal ulcer. Three years later, while in the south, he had a fainting spell, prostration, and temporary loss of coördination and memory, probably a cerebral accident of arteriosclerotic origin. At that time his heart was still fibrillating and he had a hypertension of 180 to 200 systolic and 100 to 120 diastolic, and a definite generalized arteriosclerosis. After several months of rest, diet, medication, and the extraction of many abcessed teeth, he improved very much and was able to get about with a few restrictions of his activities.

Three months previous to the present illness he had suffered a sudden sharp pain in the calf of the left leg which became tender to touch and use. This very gradually improved over the next two months and was diagnosed as a thrombosis of a small artery in the leg. At this time he went to California and while there had another cerebral accident, accompanied by convulsions. He soon improved enough to take the train for Saint Paul.

Present Illness.—At 8 p.m. the day before admission to the hospital he was on the train west of Kansas City en route to St. Paul. He felt a vague abdominal discomfort so did not eat a regular dinner, but took some clear broth. At 9 p. m. he was stricken with a sudden severe abdominal pain, accompanied by some shock and some nausea. The pain was so severe that the train was held at Kansas City while a physician was sent for. Meanwhile he became better and the doctor found no tenderness or rigidity and no fever, and advised him to continue homeward, feeling that the attack was not of a serious nature. During the night he gradually became distended and began to vomit a black watery material and developed general abdominal tenderness. A physician on the train gave him some morphine and when I met him at the station at 2 p. m. the following day told me of the development of his symptoms. At this time he was cyanotic, cold, in shock, with much abdominal distension and tenderness, constantly spitting up thin black vomitus.

He was sent to the Miller Hospital and put in an oxygen tent. Nasal suction withdrew one and a half gallons of fluid containing some old blood from the stomach. This reduced the pain and distension and now the greatest tenderness was in the right lower quadrant.

The laboratory reported 37,500 leukocytes. The urine contained albumen and sugar (4 plus), 10 to 12 granular casts, 3 to 6 r.b.c., 2 to 4 w.b.c. and no acetone. His pulse ranged from 100 to 125, temperature 100 to 104, respirations 20 to 24, and blood pressure 118-80.

After consultation a diagnosis of possible perforated appendicitis or probable acute mesenteric thrombosis was made, the latter better fitting the history and development of the case.

His condition did not warrant operation so he was treated with nasal suction, oxygen, intravenous glucose and insulin, and digitalis. He gradually became worse and died fourteen hours after admission.

Autopsy.—The peritoneal cavity contained 500 c.c. of dark bloody fluid. The liver extended 3 cm. below the ribs. The gallbladder was normal. The stomach was dilated. A duodenal ulcer 7 mm. in diameter was present. The small intestine was dark red, slightly distended, and its wall swollen. The mucosa was blackish red in color and showed punctuate hemorrhages. Similar changes were noted to a less extent in the cecum and ascending colon. The mesentery was swollen. The superior mesenteric artery near its origin at the aorta was occluded by a firm organized coagulum. The aorta showed diffuse arteriosclerosis and along the lower portion of the abdominal aorta was a flat thrombus fairly adherent to the sclerotic roughened intimal surface.

A small artery supplying the anterior tibial group of muscles of the left leg was partially occluded by sclerosis.

There was red infarction in the right lung and there were areas of atelectasis.

Summary

Acute mesenteric arterial thrombosis is a dramatic abdominal catastrophe, almost always fatal.

It is most often caused by arteriosclerosis of the artery, and in such cases occurs in individuals who probably have had earlier signs of arterial disease, spasms or even thrombosis elsewhere.

The symptoms are quite definite if one remembers that they represent the progress from first an acute arterial occlusion to later intestinal obstruction, gangrene and peritonitis.

The treatment is early operation with a chance of cure only if there is a relatively small extent of the intestinal tract affected.

CONFLUENT CALCIFICATION OF AORTIC AND MITRAL VALVES*

ROBERT L. NELSON, M.D., and ARTHUR H. WELLS, M.D.
Duluth, Minnesota

We wish to present an unusually interesting case of combined stenosis and insufficiency of both aortic and mitral valves. It has been selected from a series of eighteen cases of aortic stenosis now under study. The so frequently debatable matters concerning etiology of calcified aortic disease and the cause of sudden death in this condition may be viewed in the light of important facts disclosed in this case.

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*From St. Luke's Hospital Departments of Pathology and Electrocardiology, Duluth, Minn.

Case Report

E. B., a fifty-five year old white housewife, dated her present illness to the night of November 19, 1938, six days before her death, at which time she attended a party and danced considerably. After the party she felt quite fatigued, slept poorly, and awakened with a feeling of epigastric distress which was not improved by taking soda. The upper abdominal distress and insomnia increased in intensity and she was admitted to St. Luke's Hospital four days later under the care of Dr. O. E. Heimark.

Further questioning revealed that for the past week she had become short of breath on mounting stairs. She had been an active, vital woman, and had borne two children, the youngest of whom is thirty years of age. She denied rheumatic fever, tonsillitis, arthritis, lues, pregnancy toxemia, and any illness of consequence. She had consulted a physician only once since the birth of her last child, and that was seven years ago. At that time she was told that she had some sort of heart disease and advised that no care was required except the avoidance of the more strenuous activities.

Examination.—The patient appeared to be about fifty years of age, was well nourished and well developed, had a somewhat apprehensive expression and insisted on sitting up in bed because lying down was uncomfortable. The pupils were normal in appearance and reaction and the retinal arteries were one to two plus sclerotic and two to three plus tortuous. The membranes of the lips, mouth, and pharynx were of normal appearance. The neck showed visible arterial and venous pulsations and there was a slight palpable sclerosis of the carotid and other superficial arteries.

The chest was of normal mature form. Respiratory motion was free at a rate of 20 per minute. Some coarse moist râles were heard posteriorly over both bases. There was a slight irregular precordial impact seen over the lower half of the left anterior chest wall. The area of mediastinal dullness was increased in all dimensions with the left lower margin 3 cm. lateral to the midclavicular line. The rhythm was dominant but subject to frequent variations from regular to bigeminal to complete block and to floods of extrasystoles or periods of auricular fibrillation. The rate varied from 20 to 80 beats per minute. There was a loud, rough, systolic bruit heard loudest over the right heart base and transmitted along the great vessels, and a soft diastolic murmur transmitted down and to the left. A systolic bruit was also heard over the second left space but could not be traced along the pulmonary distribution or laterally toward the axilla. Blood pressure was 130/70 during a period of regular rhythm and varied widely with other forms of rhythm.

The abdomen was slightly distended. The liver was palpable as a slightly tender, smooth mass with the margin extending from the epigastrium to the anterior axillary line below the lower costal margin. The remainder of the physical findings were not unusual.

Laboratory.—The urine was normal chemically and microscopically. The hemoglobin value was 12.7 gm. per 100 c.c. of blood. Erythrocytes numbered 4,330,000 and leukocytes 10,700. Blood smears were normal and the differential count showed 71 per cent neutrophiles, 9 per cent of which were non-segmented, 1 basophile, and 24 lymphocytes. The blood cholesterol level was 230 mgms. per cent and that of the blood uric acid was 5 mgms. per cent. The basal metabolic rate was plus 26. A six foot film of the chest showed increased broncho-vascular shadowing of the passive congestion type in the lower lung fields (Fig. 1). The total chest diameter was 27 cm. while the heart shadow extended 6 cm. to the right and 11 cm. to the left of the midsternal line, making the cardiothoracic ratio 63 per cent. An electrocardiogram taken on November 22 (Fig. 2) showed a left bundle branch block, a variable 2:1 and 3:1 A-V block, and 24 different forms of ventricular ectopic complexes in a single lead.

Diagnosis.—The diagnosis was listed as cardiac, calcification of the aortic valve with stenosis and insufficiency, hypertrophy of the left ventricle, left bundle branch block, incomplete auriculoventricular block, multiple premature ventricular contractions, and class 2 b (temporary class 3).

Progress.—Following the use of morphine and intravenous administration of glucose solution she stated that she had had the first good rest for several days. There was almost complete loss of epigastric discomfort and most of the râles disappeared. The rhythm was still fluctuant. Digitalis, added cautiously, and quinidine sulphate reduced the degree of ectopic arrhythmia. There was a progressive decrease in abdominal distention and palpitation. The desire for food reappeared and she was able to rest in the supine position. On November 25 she felt that she had fully recovered and wanted to return home. When last seen about 6:30 P. M. she was in excellent spirits and showed relatively long periods of regular rhythm. During the evening she had visitors who disturbed her and in spite of 6 gr. of sodium amytal she was unable to sleep. At 5:00 A. M. she asked for some hot milk and at 5:30 stated that she finally felt relaxed enough to sleep. Soon after this she appeared to be asleep. At 6:45 A. M. the night nurse went in to make her last observations and found her dead.

Autopsy.—The essential postmortem examination findings were confined to the heart and involved other organs only as the result of chronic passive congestion resulting from long standing, low grade cardiac insufficiency.

The 640 gram heart was generally enlarged but particularly so in the left ventricle. The left lateral border was 11.5 cm. beyound the mid-sternal line at the apex and the right lateral border 6 cm. to the right. Both atria were at least twice their normal size with moderate thickening of their walls and clouding of the endothelium but without mural thrombi. The myocardium of the right ventricle was mildly hypertrophic while that of the left ventricle was decidedly thickened and firm, measuring from 2.5 to 3 cm. in thickness. Coronary arteries were very mildly sclerotic and there was no fibrosis in the myocardium.

The entire mitral valve was severely and uniformly thickened and fibrotic with its margins forming a continuous fibrotic ring which in turn was contracted into the ventricular cavity by thickened, short chordæ tendineæ. The slit-like opening measured 10 cm. by 1.5 cm. and barely admitted the tip of the index finger. The margins could be altered very little by pressure. The aortic cusps were remarkably thickened and fibrotic with fusion of their margins in such a manner as to form a triangular opening whose thickened, rounded edges measured from 0.8 to 1.0 cm. and were unyielding to opening or closing forces. Aortic and mitral valves had identical lesions except for numerous pin-head sized, roughly rounded, calcified nodules generally in thick conglomerations on both the aortic and cardiac aspects of the fused aortic leaflets. A thick spur of these conglomerated, hard nodules tapered directly down from the aortic to the adjacent portion of the mitral valve to its thickened margin where it blended into the dense fibrous tissue containing but little calcium (Fig. 3).

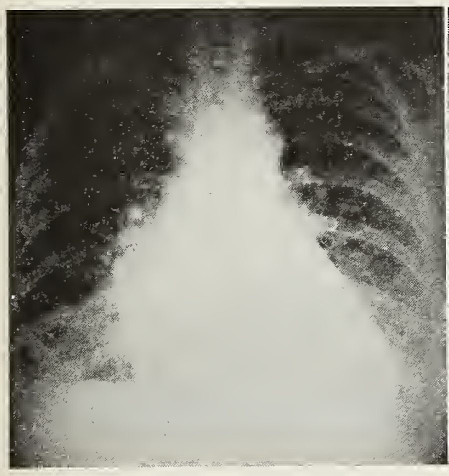

Fig. 1. Six-foot chest film showing pulmonary stasis, large heart and absence of shadows of calcified valves.

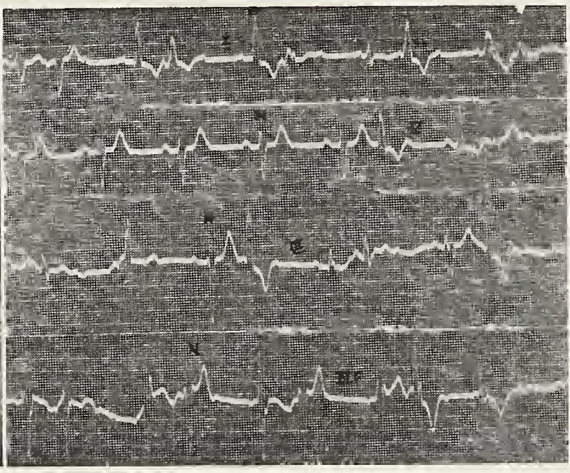

Fig. 2. Electrocardiogram described in text.

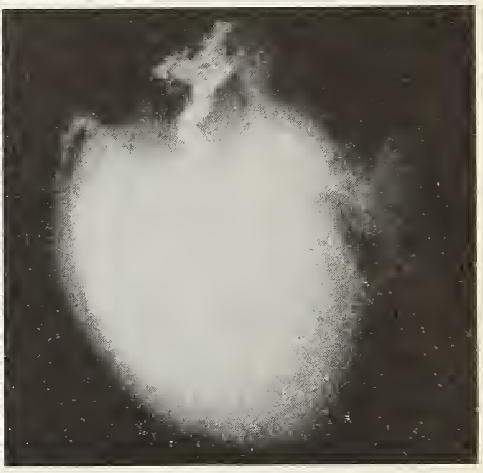

Fig. 3. Radiograph of excised heart showing extent of calcification.

There was an area of endocardial fibrosis with hyalinization measuring up to 1 mm. in depth covering an area of about 1 cm. in diameter through which the first part of the left bundle of His must pass. This area underlaid the calcified spur between the aortic and mitral valves.

The lungs, liver, and spleen were not altered except for a grade III chronic passive congestion as demonstrated by gross and microscopic changes. The abdominal aorta had a grade III atherosclerosis. Smaller arteries were only mildly sclerotic in the abdominal and thoracic viscera.

Comment

The mechanism of sudden death which accounts for the exitus of approximately 5 per cent of patients with aortic stenosis has to our knowledge never been studied with the electrocardiogram at the time of death. The altered electrical phenomena present in our patient's heart as revealed by electrocardiography four days before her death suggest the conditions present in other diseases of the heart which have been studied with the electrocardiogram at the time of death attributed to cardiac standstill or ventricular fibrillation. The fibrotic plaque in the course of the left branch of the bundle of His was directly beneath the massive calcified spur in the mitral valve and may well have been caused by constant percussion of two surfaces. No other lesions could be demonstrated in the conductive mechanism which might account for the left bundle branch block and the possible cardiac standstill. The very numerous extrasystoles from very numerous foci in the ventricles are generally interpreted as arising from a myocardium made irritable by inadequate coronary flow or anoxia. It is not difficult to imagine an increase in this irritability to a state of ventricular fibrillation and death.

Pathologists are generally agreed as to what constitutes a stenotic mitral valve resulting from rheumatic fever. In spite of the lack of a history of rheumatic fever in our patient, her mitral valve is a classical example of the end-result of this disease. Furthermore the close relationship between the fibrotic conditions in the aortic and mitral valves in this case is heightened by a spur of calcified nodules running between the two valves and blending in the pathologic changes in each valve.

Summary

1. The case of a fifty-five-year-old woman dying suddenly and unexpectedly after a one week's illness as the result of combined stenosis and insufficiency of both aortic and mitral valves of the heart has been presented.

2. Electrocardiograms taken shortly before her death revealed the likely cause of death to be either cardiac standstill or ventricular fibrillation.

3. The classical rheumatic stenosed mitral valve was fused with a typical calcified nodular aortic valve, indicating the common etiologic agent in this case.

DERMOID OF THE CEREBRAL HEMISPHERES*

ROYAL C. GRAY, M.D., Ph.D.

Minneapolis, Minnesota

BELL[1] classifies complex tumors arising from vestigial tissues and involving the central nervous system as epidermoid, dermoid, or teratoma depending upon the number of dermal layers affected. An epidermoid has only ectodermal tissue. A dermoid includes tissues of mesodermal as well as ectodermal origin; endodermal derivatives are commonly not present. A teratoma usually contains tissues or organs from all three germ layers.

Accordingly, an epidermoid contains only squamous epithelium; rarely it may also have basal type of epithelium. A dermoid, in addition to the epithelium, contains any or all of the mesodermal elements such as sweat glands, sebaceous glands, hairs, or hair follicles. A teratoma is increasingly complex and hence may also have endothelial mucus-secreting membranes of ciliated or goblet cells or distinct parts of fetal organs or tissues.

Some authors incorrectly classify epidermoids and dermoids as cholesteatomas. Cholesterol results from cellular degeneration, is probably present in variable amounts in all types of neoplasm, and therefore its mere presence in a cerebral tumor does not necessarily indicate that the tumor is a cholesteatoma. A true cholesteatoma, which is a granuloma rather than a real neoplasm, is an excrescence occurring either in the cavity of the middle ear or in its immediate vicinity and is composed of desquamated material incident to chronic otitis media. An incomplete classification sometimes made is that a genuine teratoma must contain elements from all three dermal layers and any complex tumor with less than the three layers, that is either an epidermoid or a dermoid, is a teratoid. Another needless definition is that a teratoma is a cystic growth which contains fetal tissues or organs while a teratoid is a solid growth which contains fetal tissues but not organs.

An elementary explanation of the origin of an epidermoid or a dermoid is that it arises from primary overgrowth of meningeal cells which may or may not undergo metaplasia. Rigby[14] states that complex tumors of the brain arise from a fetal inclusion of dermal cells which are carried in to the brain vesicles during the formation of the medullary groove. Critchley and Ferguson[5] further postulate that according to the depth of the inclusion layer or the embryonic age of its cells it will become either a dermoid or an epidermoid. Likewise, Bostroem[3] states a dermoid results from overgrowth of an embryonically early dermal cell inclusion which occurs in the first two or three weeks of embryonic life and therefore involves a younger and more primitive dermal cell layer. A later inclusion, at the fourth or fifth week when the skin has taken on a more definite form, leads to an epidermoid.

Horrax[7] agrees that the depth of the dermal cell layer of the tumor anlage determines the type of "cholesteatoma" (dermoid or epidermoid). However, since hairs and hair follicles may be found in tumors which are otherwise typically epidermoid, he would classify "cholesteatoma" as hair-containing (typically dermoid) or non-hair-containing (typically epidermoid). He further states that a teratoma represents involvement of the deepest dermal layer or at least indicates that the cell inclusion may have added potentialities.

Montgomery and Finlayson[11] described a complex tumor, involving both the middle and posterior fossæ, whose structure was dermoid in the former and epidermoid in the latter site. These authors, like Horrax, apparently considered that there may be no precise differentiation between a dermoid and an epidermoid type of tumor.

Bland-Sutton[2] explains the origin of intracranial dermoids, and presumably also other intracranial complex tumors, as follows. Early in embryonic life the dura mater and skin are in contact. Later the developing skull bones normally separate the dura and skin, but if the separation is incomplete a portion of the skin may adhere to the dura and act as a tumor anlage. Also, during the invagination of the dura in the formation of the tentorium a parcel of skin may be caught between the dural folds and give rise to a complex tumor. Ewing[6] considers the origin of complex tumors under the following headings:

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*From the Division of Nervous and Mental Diseases, University of Minnesota Medical School.

(a) Relations of the medullary groove to the ectoderm;
(b) Complex steps in the formation of the brain and ventricles;
(c) Formation and union of the cranial bones;
(d) Traumatic implantations of portions of ectoderm.

The clinical differentiation between epidermoids and dermoids is summarized in the table by Brock and Klenke[4] (Table I).

TABLE I

	Epidermoids	Dermoids
Ratio of incidence	About 2 : 1	About 1 : 2
Age incidence:		
At birth	None reported	Occur
0 to 20 years	Few	Occur
30 to 45 years	Usual time of appearance	Occur
Site:		
Intracerebral	None	Frequent — especially in temporal lobe
Cerebellopontine angle	Occasional	Never
Cranial bones only	Frequent (in diploë)	None
Spinal	Rare	More frequent
Multiplicity of tumors	Often single; usually multiple	Usually single; occasionally multiple
Pearly sheen	Frequent	Occasional
Cystic	Occasional	Frequent
Associated with other congenital anomalies	Rare	Frequent

An intracranial complex tumor, because of its very slow growth and commonly silent location, may produce no pathognomonic signs or symptoms. Practically without exception the diagnosis is made at operation or autopsy. In the experience of Love and Kernohan[9] complex tumors should be suspected where mental disturbance is associated with long-standing headache and a suggestion of increased intracranial pressure.

A skull roentgenogram may be useful in the diagnosis of an intracranial complex tumor. Kwan[8] reported an instance of a perforation of the occipital bone with clinical evidence of a posterior fossa tumor. The tumor, subsequently proved to be dermoid, had a pedicle which extended through the occipital perforation. Intradiploic epidermoids which have extended intracranially, either extradurally or intradurally, cause cranial bone absorption and have characteristic roentgenograms. The bone defect is usually rather large, sharply outlined or scalloped, and has a smooth and thickened border. A crescentic roentgen shadow caused by a calcified area in the wall of a dermoid has been noted by Horrax,[7] Rand,[12] and Brock and Klenke.[4] The latter have also noted in intracranial dermoids small areas of calcification forming a cluster and appearing somewhat like an ependymoma. Rigby[14] reported roentgenogram findings of numerous teeth in the neighborhood of the sella turcica.

Dermoids may communicate with the ventricular system or subarachnoid space and thus lead to the presence of sebaceous material in the cerebro-spinal fluid as noted by Raymond, Alquier and Courtellemont[13] and Lua.[10]

A tumor of tridermal or even bidermal origin involving the brain and particularly the cerebrum is rare. Only from one-half to one per cent of intracranial tumors arise from such embryonic rests. Dermoids which communicate with the lateral ventricles are very unusual and a bilateral cerebral dermoid apparently has not been previously described. The following case report is therefore presented.

Case Report

This patient, an Indian, was admitted to the Minnesota General Hospitals January 23, 1931, and discharged March 27, 1931. He was twenty-eight years of age, married, and a teacher in a reservation school. The chief complaints were mental confusion and unsteadiness in gait.

The family history was unobtainable. His personal history previous to seven years before admission was unknown. He had been married five years; his wife and two children were living and well. He graduated from Haskell Institute in 1925 and thereafter taught grades one to four in reservation schools.

During the early summer of 1929 he complained of some disturbance in vision and obtained glasses. In July of that year he was involved in an automobile accident. No injuries of consequence were noted but for a while subsequently he complained of occipital discomfort.

During the fall of 1929 the patient's writing became somewhat illegible, the letters in words being crowded together. Whereas formerly he was a very companionable individual he became more retiring and seemed to avoid others' company.

During the fall of 1930 it was noticed the patient's students were not progressing as they should. Later that fall the patient began to walk in short steps as though he were afraid of falling. He developed transitory tremors in his extremities. He was obliged to relinquish his teaching duties.

About January 1, 1931, he had a period of nausea and vomiting. He became confusional and hallucinatory. His gait and station were increasingly unsteady.

Physical Examination.—He was 5 feet 9 inches tall and weighed 152 pounds. His best weight was 185 pounds, in 1928. His pulse rate ranged from 60 to 80. His temperature varied from 98° to 99°F. His blood pressure averaged 122/84.

He was well developed and well nourished. His facial expression was vacant and somewhat bewildered. His general physical examination was negative except for a marked icthyosis, rather poorly kept teeth, and minor cervical adenopathy. He had no congenital anomaly or defect.

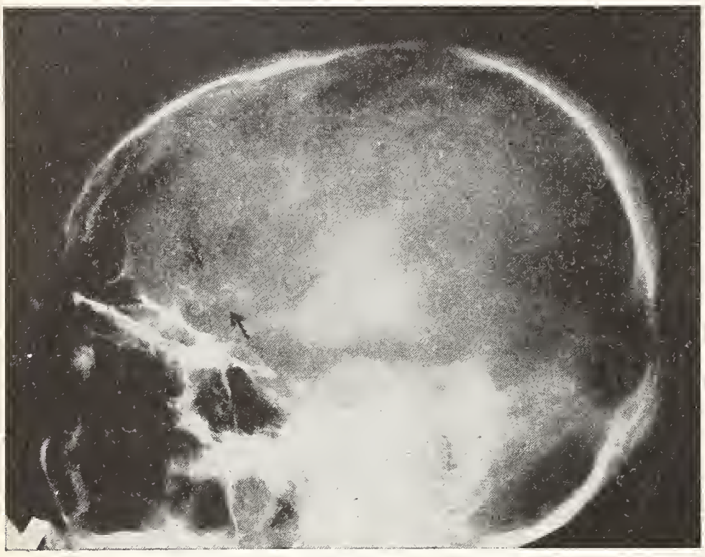

Fig. 1. Skull roentgenogram showing crescentic dotted area of calcification.

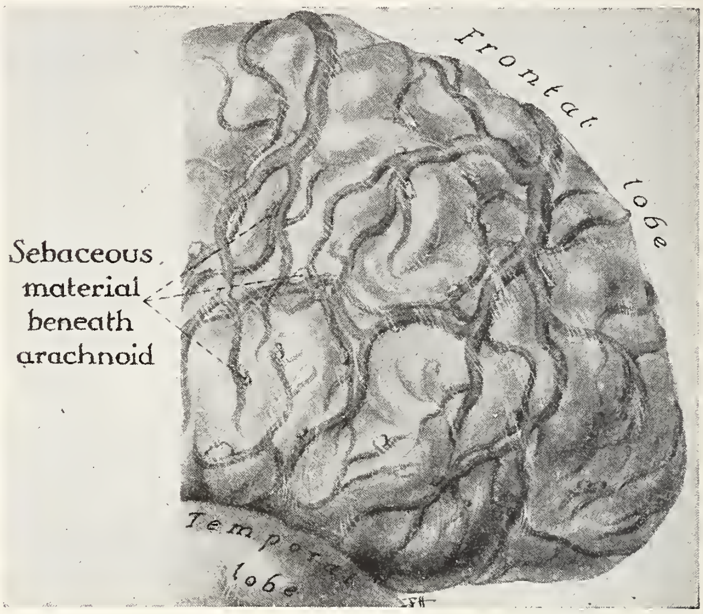

Fig. 2. Sketch showing areas of subarachnoid sebaceous material.

Neurologic Examination. — The patient identified camphor as mentholatum and wintergreen as peppermint. Fields of vision and visual acuity were unsatisfactory because of poor coöperation. The optic discs had an apparent pallor probably due to contrast with the physiologically pigmented fundi. There was an inconstant bilateral horizontal nystagmus more marked on looking to the right. All other objective tests of the cranial nerves were negative.

Attention was good when toe position and vibration sense were tested and these senses appeared to be normal. While various coins were correctly appreciated in either hand, outlines of figures were less accurately recognized on the left than on the right thigh. He maintained that pin prick felt less sharp on the left than on the right lower extremity. Often superficial or deep sensory stimulations seemed to startle the patient and initiate generalized gross tremors.

Except for a slightly increased (1+) left knee jerk the deep reflexes were normal. The abdominal reflexes were all present but on stroking the abdomen the abdominal muscles contracted so forcefully evaluation of the individual abdominal reflexes was impossible.

Muscle power and tone were somewhat below average. The motor system so far as could be determined was otherwise normal except for frequent rather gross tremors of the extremities, especially prominent on any voluntary movement.

The usual tests for coördination were normal. He was unsteady in the Romberg test and stood in a stiff-legged fashion. He walked somewhat on his heels with the knees held rather stiffly. He had incontinence of bowel and bladder.

His general behavior was abnormal. He frequently glanced suspiciously toward the door of his room. He occasionally had inappropriate forceful outbursts of laughter. He also had periods of crying and of boisterous singing. He would wander about in the corridors. He would lie on top of his bed and be disinclined to remove his bathrobe and lie beneath the bed covers. However, he was in no way resistive. At times he would converse in a fairly normal manner although generally he did not initiate any conversation. His responses to questions were delayed or more often he made no answer. Instead, he would fumble with his slippers or clothing or glance suspiciously about the room.

He said horses were on the other side of the hill and insisted he go and chase them away. He thought black ghosts were secreted in his closet. He once became very excited, saying he smelled smoke, and that he wanted to save himself. He frequently complained that voices talked to him through the windows, especially at night, disturbing his sleep.

He was commonly quite disoriented. His memory was very imperfect both for recent and remote events. His grasp of general information was fair; however, he would make no attempt at any simple arithmetical calculation. His insight was faulty; he said he was perfectly well and should be home at work.

A skull roentgenogram (Fig. 1) showed a crescentic dotted area of calcification about two centimeters to the right of the midline, posterior to the frontal sinus and just above the floor of the anterior cranial fossa. There was slight evidence of increased intracranial pressure. There was no erosion of the structures at the base of the skull.

A chest roentgenogram was negative.

The cerebrospinal fluid was clear, colorless, pressure 255 millimeters of water, cells 4 lymphocytes, Nonne positive, Noguchi positive, qualitative sugar slightly increased, Wassermann negative, and colloidol gold curve 0003455111. Hemoglobin was 105 per cent. Leukocytes numbered 7,200 with a normal differential count. Blood Wassermann test was negative. The urinalyses were negative.

The patient was operated upon by Dr. William T. Peyton of the Division of Neuro-Surgery on February 25, 1931. The pre-operative diagnosis was right frontal brain tumor, probably cystic with calcification. An osteoplastic flap was turned down exposing the right frontal lobe and the anterior portion of the right parietal lobe. Multiple whitish circular subarachnoid areas were noted (Fig. 2). The areas appeared like fat droplets and were particularly grouped along the larger vessels in the sulci. They were of various sizes, the largest being about two millimeters in diameter. The brain was not under tension but rather appeared collapsed. A brain needle inserted in the region of the anterior portion of the right lateral ventricle brought forth cerebrospinal fluid with suspended drops of fat. A needle inserted somewhat more posteriorly emitted clear fluid. A portion of the right frontal lobe was excised with the diatherm. In the excision the anterior horn of the right lateral ventricle was exposed. Immediately medial to the anterior horn and separated from it only by a very thin septum was a dermoid cyst. In fact the wall of the cyst projected somewhat into the anterior horn. The right lateral ventricle was greatly dilated.

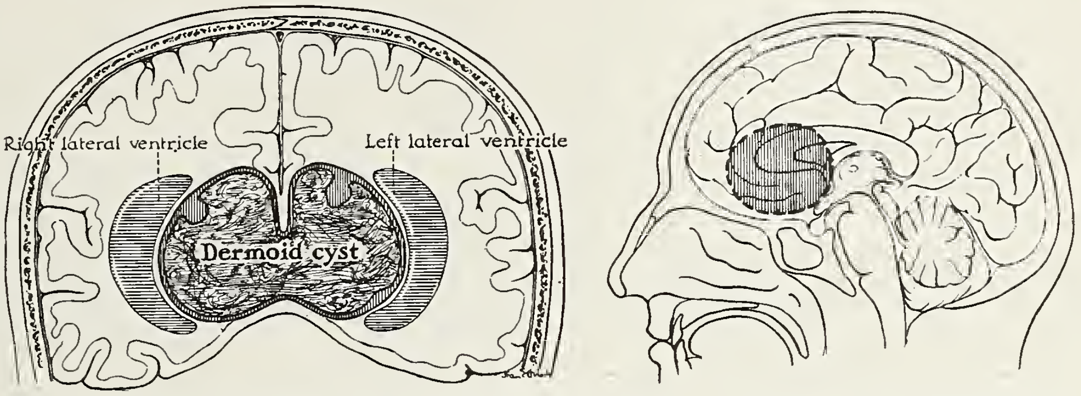

Fig. 3. Sketch of dermoid according to record of operation. A, lateral view; B, frontal view.

The cyst (Figure 3, A and B) was a dumb-bell shaped structure with its isthmus in the region of the anterior commissure. The isthmus was about 1.5 centimeters in diameter and expanded into right and left sacs each about 4.0 centimeters in diameter. The left sac, like the right, was medial to the anterior horn. The entire cavity of the cyst was well filled with sebaceous material containing hair. The cyst had a smooth lining for the greater part with some papillary growths or plaques projecting into it. These projections, or dermoid tufts, represented the locations of the original dermal implantations and the places of greatest growth. The estimated capacity of the cyst was three to four ounces.

All accessible portions of the lining of the cyst, including the dermoid tufts, were cauterized with the endotherm. The cyst itself was too large and had too many ramifications for complete extirpation. The osteoplastic flap was replaced; the epicranium and skin were sutured.

The immediate postoperative course was uneventful. Ten days postoperatively for a period of four days the patient was drowsy and listless. Considerable difficulty was experienced in turning him onto his left side. Following this period his recovery was uninterrupted.

One month postoperatively the cerebrospinal fluid was clear and straw colored, pressure 100 millimeters of water, cells 10 lymphocytes, Nonne negative, Noguchi positive, and Wassermann negative. Tests for fat were positive.

When discharged from the hospital, March 27, 1931, his condition was somewhat improved. His cranial nerves were normal, so far as could be determined, except for inaccuracies in recognizing odors. Intermittent gross tremors appeared throughout the body as before and hampered examination. It was rather difficult to evaluate the deep and superficial reflexes. In general, the former were slightly increased (1+). Muscle power and tone were decreased in a corresponding degree. All coördination and sensibility tests were unsatisfactory because of the tremors. Station was normal. His gait was less stumbling but he still held himself stiff-legged and tended to sway from side to side. He continued to be incontinent.

He remained quietly in his room in bed or sitting in a chair. He would promptly do whatever requested as best he could. He ate well though he was rather untidy in feeding himself. There was no disturbance in his mood. He recalled hearing strange sounds and voices previously but maintained he had no such experience since his operation. He was well oriented for person and place but not for time. His memory for both recent and past events was considerably improved. His grasp of general information was more accurate. His insight remained somewhat faulty.

The patient returned to the reservation hospital for continued convalescence. He died there on April 6, 1931, following a few days of apparent coma. A necropsy was not performed.

Summary

1. A case of bilateral cerebral dermoid is reported.

2. The history and clinical findings were indicative simply of a cerebral tumor.

3. A skull roentgenogram may be helpful in the diagnosis of a dermoid or other complex tumor involving the brain.

4. A dermoid may lead to the presence of sebaceous material in the cerebrospinal fluid within the ventricles and subarachnoid spaces.

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THE PRESENT-DAY STATUS OF JUVENILE DIABETES MELLITUS*

A Review

JOHN M. ADAMS, M.D.
Minneapolis, Minnesota

DIABETES mellitus is a disturbance of carbohydrate metabolism characterized by a tendency to abnormal elevation in the blood sugar. Hyperglycemia leads to glycosuria, disturbances of nutrition and regulation of water and acid-base balance.

The disease in children is more severe, complicated by factors of growth and development. The only effective way to control diabetes is by proper diet and insulin administration, regulated to suit the particular patient's needs.

Incidence

The incidence has almost doubled in the past fifteen years. In the past twenty-five years increase among females is 125 per cent as compared to 20 per cent in males. At present about 1 in every 350-500 persons is diagnosed biabetic. Dr. Eliot P. Joslin[6] at Round Table discussion in June, 1937, stated: "Even with the use of insulin today a greater percentage of children are dying with diabetic coma than was the case for all diabetics (adults and children) before the time when insulin was discovered."

Race

Diabetes is most common in the white race, and Jews and Irish are particularly susceptible, the disease being twice as common among Jews as non-Jews.

Etiology

1. Clinically diabetes represents a functional or relative inadequacy of insulin. This results from an imbalance between the forces concerned with storage, mobilization and utilization of sugar in the tissues of the body. Unlike the condition found in other dyscrasias of the glands of internal secretion, no adequate fundamental pathological changes can be demonstrated in the pancreas or elsewhere. Houssay[5] defines diabetes as a disturbance in carbohydrate metabolism in which the normal balance of regulating factors is altered. It remains, however, a condition relieved by pancreatic extract, insulin.

2. *Heredity*

The work of Pincus and White[9] is the most reliable study of data to date. These workers postulate the following:

1. Diabetic mother + diabetic father = all children predestined to be diabetics.
2. Diabetic parent + carrier of potentiality to acquire diabetes = ½ of offspring predestined to diabetes.
3. Carrier + carrier = ¼ of offspring predestined to have diabetes.
4. Diabetic + person who does not have diabetes or is not a carrier = none of children predestined to diabetes.

Steiner[8] studied 411 children whose fathers were diabetics, and reports an incidence of 22.2 per cent ±5.4 per cent among the children. Of 4,787 children of non-diabetic parents the incidence of diabetes was 1.14 per cent ±.3 per cent.

It is a recessive character transmitted in accordance with Mendel's law.

3. *Overweight* is not a predisposing factor in childhood (Boyd[2]).

White[10] reports that 87 per cent of the patients studied were overheight at the onset of their diabetes, the average being 2.4 inches (6.4 cm.). Bogan[1] states that osseous development was eighteen months in advance of the age and dental development twelve months in advance at the onset of the disease. The average basal rates in eighty-six cases were +12 per cent, and the average I.Q. was 10 points higher among diabetics.

4. *Infection* may be the precipitating factor which causes the clinical signs and symptoms of diabetes to appear.

5. *Endocrine* (pituitary and pancreas)

Evans and others have noted an inhibiting effect of extracts of anterior lobe on pancreatic extract insulin. Houssay has demonstrated the following:

a. Anterior lobe extract causes in dogs increased blood sugar values and glycosuria.

b. Removal of pituitary gland causes an increased sensitivity to insulin, hypoglycemia, and may result in convulsions or death.

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*From the Children's Diabetic Service, Minneapolis General Hospital and Department of Pediatrics, the Nicollet Clinic. Presented at the meeting of the Hennepin County Medical Society, February 15, 1939.

c. When the pituitary gland is removed from a pancreatectomized dog, the glycosuria, hyperglycemia and acidosis are relieved. This animal is nown as the "Houssay dog," having both pancreas and hypophysis removed. Collip believes that there is definite evidence of a diabetogenic factor in the pituitary secretions, its action being opposed to insulin. It has often been noted that acromegalics are predisposed to diabetes.

Young[11] was able to produce diabetes in dogs by prolonged administration of anterior lobe extracts. The animals developed marked obesity preceding the development of diabetes.

The age incidence of juvenile diabetes follows the peaks of increasing activity of the pituitary gland. These peaks are at the ages of 6 and 12 years. Long[7] has shown that depancreatized infant rats do not develop diabetes immediately but do so on the 19th day coincidentally with growth.

Symptoms

The onset may be sudden with coma and death. There may be a gradual increase in polyuria, polydypsia and polyphagia, followed by loss of weight, strength and energy. The physical examination may be negative unless acidosis exists. The odor of acetone is then present on the breath. There may be dyspnea (air-hunger), respirations being deep and regular. Temperature may be subnormal or elevated, eyeballs soft, cheeks flushed, lips, mouth and skin dry. Fluids and insulin are essential in the treatment of coma. A plan for their administration, which has proven very satisfactory, is as follows:

1. 40 c.c. of 1/6 molar sodium lactate per kilo of body weight intravenously in the first 12 hours.
2. 60 c.c. of saline per kilo of body weight subcutaneously in the first 12 hours.
3. 2 units of insulin per kilo (1 unit intravenously and 1 unit subcutaneously).

Sodium bicarbonate may be used intravenously in very severe cases of acidosis when the CO_2 combining power is below 20 volumes per cent. A formula for its use is as follows:

55 normal CO_2 combining power
$\underline{15}$ vol. % of patient
40=difference (D)

$$\frac{D \times \text{wt. in kilo}}{40} =$$ grams of sodium bicarbonate to be given in a 4% solution intravenously.

Treatment should be instituted before the CO_2 combining power can be determined.

In all cases of diabetic coma careful search should be made for complications such as pneumonia, tuberculosis, otitis media or acute upper respiratory infection.

Course and Prognosis

In untreated, the disease goes on to coma and death. Poorly treated cases result in a retardation of growth and maturation. If well treated, there will be normal growth, development and maturation, plus excellent health. If poorly controlled, the patient may appear to get on well but diabetes increases in severity and the life span is shortened. Well treated children live as long or longer than non-diabetics.

Diagnosis

The coexistence of persistent glycosuria and hyperglycemia is sufficient for diagnosis. The symptoms enumerated previously are usually present. The condition may simulate the acute abdomen, often being mistaken for acute appendicitis. The dehydration following vomiting, diuresis and hyperpnea may cause the white blood cells to be markedly elevated. (The last patient I saw in coma had a white blood count of 63,000.) The temperature may be elevated, leading to the impression of severe infection of some sort. Severe acidosis may simulate uremia, meningitis, brain injury or severe toxic states.

Diagnosis of Insulin Shock

The respirations are normal or slow; there may be slight cyanosis.

The pupils are dilated, pulse slow and full.

The skin is moist due to perspiration.

The first symptoms are irritability and nervousness, increased hunger; twitchings and convulsions may be present. The usual story is as follows:

Patient took insulin, refused to eat and vomited. Urine may or may not show sugar. If in doubt, always give sugar; 10 c.c. of 10 per cent solution of glucose intravenously is most useful. Small amounts of orange juice or milk may be used in mild cases. It is to be emphasized that small amounts should be given if the shock is mild in order not to throw the patient into marked hyperglycemia. In cases of severe shock, when the patient will not take sugar by mouth and intravenous therapy is difficult, adrenalin may be given hypodermically, causing a rather prompt response on the part of the patient. Adrenalin mobilizes body stores of glycogen.

Contrasted with the above picture is that seen when protamine zinc insulin is being used. The symptoms may be quite different, chief among them being headache, nausea, vomiting and weakness. The skin may be dry. The warnings are not nearly as striking as those of plain insulin. The shock may be much more profound, lasting often several hours in spite of treatment. The picture as a whole may resemble coma more closely, adding considerably to the difficulty of diagnosis.

Management of Uncomplicated Diabetes

A diet must be prescribed to meet all the physiological needs and insulin must be given sufficient to cover the diet.

The diet requirement is the same as for a normal child, being determined largely by the child's appetite, but 25 to 35 calories per pound are usually needed, depending on activity.

Diets must meet all protein, mineral and vitamin requirements by giving foods high in protective factors such as milk, eggs, succulent vegetables and fruits, butter and cod liver oil.

The protein requirement is figured from height and weight, allowing 1.5 grams per pound in the young or undernourished child, and 1 gram per pound in older children. The other factors are calculated from the basic protein requirement.

Boyd's tables have been very useful. He uses a ration of P 7, CHO 15, fat 11, for normally nourished children in middle or late childhood, and a ratio of P 10, CHO 20, fat 15, for undernourished children and the period of early childhood.

For example, a child 5 years of age, weighing 40 pounds at 1.5 grams of protein per pound would require 60 grams of protein, 120 of carbohydrate and 90 of fat (1530 calories or 38 calories per pound). Or an older child ten years of age and weighing 70 pounds, allowing 1 gram of protein per pound, would receive 70 grams of protein, 150 grams of carbohydrate and 110 grams of fat (1870 calories or 27 calories per pound).

Diabetic foods in cans, accepted by Council on Foods, may be given but must be included in the diet, not added. Many people have the impression if a food is diabetic, they may eat all they want.

Plain insulin should be given three times daily. If the requirement is over 40 units, the patient may need it four times daily.

If large, infrequent doses are given, the patient may oscillate between shock and glycosuria during the twenty-four-hour period. Requirement varies from day to day, depending on activity and the presence of infection. Roughly, 1 unit of insulin is required for every 1.5 grams of sugar excreted in the urine in a 24-hour specimen.

Frequently diabetic children have a swing in the blood sugar curve with glycosuria marked in the morning and following breakfast. The sugar tolerance seems to be lowered by the all-night fast. The swing is best handled by midnight insulin.

Protamine Zinc Insulin

Protamine zinc insulin is said to have many advantages because of slower absorption and its more prolonged effect. The difficulty of regulation is met with in children and the hazards of severe prolonged shocks are much more marked than with plain insulin. The shock usually occurs early in the morning at 5 or 6 a. m. Protamine insulin should be used alone only in mild cases requiring 20 units of insulin or less. If more is required, a combination of protamine and plain insulin works very well in many cases. Protamine insulin has an accumulative effect and its maximum result is not often seen for two or three days, due to the pile-up in the individual. The use of protamine insulin for two-thirds to three-fourths of the patient's insulin requirement, the remainder being supplied by plain insulin, is most satisfactory.

Example: If a child requires 60 units of insulin, 40 can be given in protamine and 20 units in plain, both given in the morning. The plain insulin takes care of the requirement during the day and the protamine helps to control the blood sugar level during the subsequent night. As the patient becomes sugar-free, the plain insulin may be reduced.

If infection occurs, such as an upper respiratory infection, and tolerance is lowered, the plain insulin may be increased. I like to think of the use of protamine mainly as a means of attempting to convert a relatively severe diabetic into a mild diabetic, to be regulated by plain insulin.

Zinc Insulin Crystals

The solution of zinc insulin crystals is a water-clear stable insulin having a pH of 2.7 and a strength of 40 units per cubic centimeter. The blood sugar lowering effect of this insulin is the same as unmodified insulin, but the duration of this effect is two to three times as great. The solution acts for twelve to fourteen hours. Preliminary reports indicate that this solution of zinc insulin crystals may be used successfully in individuals who are sensitive to regular insulin. It is suggested that the prolonged effect comes as the pH of 2.7 on injection is raised by the body fluids to approach pH 7.4 crystallization taking place, rendering the insulin more slowly absorbable, as is the case with protamine insulin. It should have many uses in juvenile diabetes.

Instructions in Home Treatment

The training of the individual patient is extremely important. A patient must be taught about the disease, the diet, the use of insulin and urinalysis. This can be accomplished very effectively in children of eight years and over. In younger children the responsibility must be placed with some member of the family. The importance of rigidly adhering to the diet and insulin administration is very essential.

The diabetic child should be considered and treated psychologically as a normal individual.

Complications

The principal complications met with are coma, loss of resistance to infection, premature development and degenerative changes, deficiency disease, metabolic disturbances of the skin, dwarfism and hepatomegaly.[6] The last two occur in about 5 per cent of the cases, and are frequently seen occurring together in the same patient.

Dwarfism is characterized by failure of growth, delayed dentition, silky hair, delicate skin, inhibited maturation with normal intelligence. Hormone (anterior lobe extracts) therapy has been effective. Protamine insulin promotes growth. Wilder has demonstrated higher nitrogen retention with protamine than with plain insulin.

Hepatomegaly may be very pronounced, the abdomen being protuberant with dilated veins. Abdominal pain may be a frequent symptom. The livers of animals in which pancreatectomy has been performed became enlarged, fat being the primary tissue of infiltration. Glycogen storage may also take place. Proper regulation with protamine insulin has given good results in the treatment of hepatomegaly. Betaine hydrochloride, choline and lipocaic (prepared from whole beef pancreas) also have been used in resistant cases. Dragstedt[3] first used lipocaic in the treatment of hepatomegaly in dogs, being able to extend the life of these animals and prevent the fatty changes which occur in the depancreatized animals. Grayzel and Radwin[4] report the successful treatment of three resistant cases of hepatomegaly with lipocaic.

Pre-operative and Postoperative Treatment

The nature of the operation must necessarily dictate the method of pre-operative and postoperative care of diabetics. In major procedures, however, the following regime has been used satisfactorily:

A liquid breakfast is given the patient with the usual amount of insulin at 6 a. m.

The operation should be scheduled from three to four hours later, when emptying of the stomach has taken place.

Insulin is given at the noon hour as of the previous day, no food being given at this time. There is a transient hyperglycemia and glycosuria which always follows the administration of general anesthesia.

In the afternoon the calculated liquid for the supper meal may be commenced and insulin is given at the usual time for the evening administration.

The second day a normal diet and insulin are used as pre-operatively.

A liquid diet may be used if necessary.

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ALOES IN THE TREATMENT OF BURNS AND SCALDS*

J. E. CREWE, M.D.
Rochester, Minnesota

RECENT medical literature contains many excellent articles on the treatment of burns. While numerous methods have been mentioned, in those most generally accepted, tannic acid is employed. In Bettman's treatment, tannic acid is applied in a spray, and this is followed by application of 10 per cent silver nitrate. Apparently, this sequence has distinct advantages over the use of tannic acid alone. Good as these methods are, I have experienced annoyance from infection, and from the long period required for separation and removal of the coagulum in some cases in which I have used tannic acid. It has been a relief to me, therefore, to find a treatment which has eliminated these disadvantages. This method has proved so simple and the results have been so satisfactory, that I have not used any other treatment for burns since the spring of 1935.

Author's Method

I employ an ointment of which the active ingredient is Socotrine or Barbados aloes. The ointment is made by mixing 2 drams of the powdered aloes and about 2 drams of mineral oil in an ounce of white vaseline. If mineral oil is not used the ointment is a little too stiff.

The usual precautions in regard to contamination and infection are taken. The affected area is cleaned as thoroughly as possible and, in some instances when the area is badly soiled, a preliminary application consists of warm moist dressings. These dressings are saturated in a solution composed of a teaspoonful each of borax and sodium chloride dissolved in a quart of water. If the burned area is fairly clean and a greasy substance has been used in first aid treatment, it is not necessary to remove all the grease as it will mix with the ointment that is to be applied.

Blisters are carefully protected and the serum is evacuated with a hypodermic needle, after which a small amount of mercurochrome is injected into each collapsed vesicle. Mercurochrome is used because of its color, and only enough is injected to cover the floor of the emptied vesicle. If the blisters are torn or the burn is deep, mercurochrome is applied with a cotton swab. Mercurochrome has been omitted in treatment of small burns, and they have remained as free of infection as those in which it has been employed. Perhaps the added precaution of its use is unnecessary.

When this preliminary treatment has been completed, sterile gauze is folded in about four thicknesses, to make an area large enough to cover the burn. If the burn is too large to be covered by one piece of gauze, or if it is in an area where a single piece would not fit snugly, more than one piece can be applied. The gauze is laid on a smooth, sterile towel and is covered with a layer of ointment at least ⅛ inch thick. This dressing is laid, ointment side down, on the burned area. More gauze may be placed on this dressing and the whole held in place with bandages or other material. No attempt should be made to spread the ointment on the burn, because it will not adhere readily to the raw surface.

Ordinarily, this dressing is not removed for two days. At the end of that time, the entire dressing can be removed as easily as a piece of wet writing paper is lifted from the top of a table. There is no sticking from dried serum or dried blood. The surface of the wound does not bleed but has a clean, glazed appearance, as if the area were covered with a thin, transparent film. Unless new blisters have formed, another dressing, prepared as before, is applied and each dressing is left in place for two days. Usually, only from four to six dressings of aloes ointment will be required. Then zinc stearate or some other bland dressing may be applied.

Illustrative Cases

It must be stated that, in the period that has elapsed since I have been using the treatment that has been described, I have not encountered any burns of sufficient severity to endanger life. There is no reason to believe, however, that good results might not be obtained by this method in treatment of more extensive burns.

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*Read before the Olmsted-Houston-Fillmore-Dodge County Medical Society, January 6, 1938.

Case 1.—A man stepped into a pit containing boiling water which had just been released from a pressure cooker in a canning factory. The leg, as high as the knee, was immersed in the water. Few blisters were encountered because most of the epidermis adhered to the patient's underclothing and stockings when they were removed. In areas the size of a silver dollar, over the maleoli, the burn completely penetrated the integument. Treatment such as has been described was applied and the patient returned to work on the nineteenth day after the injury.

Case 2.—A girl, sixteen years of age, spilled boiling water over her feet. The very severe scald involved most of the surface, except the soles, of both feet to above the ankles. This patient lived in the country and came to the office for treatment only four times, on alternate days. The feet were coated with lard when she first was seen. Results from the treatment which has been outlined were satisfactory.

Other cases.—Two infants suffered smaller burns on the face, arms and chest, by falling against heating stoves. Dressings were easily applied because their application and removal were painless.

Two patients, with severe sunburn involving the shoulders and most of the back above the waist, both complained bitterly of pain when they came for treatment but they suffered practically no pain after the first dressing was applied. Only two dressings with the ointment were required. Then zinc stearate was applied.

Comment

My interest in aloes for the treatment of cutaneous conditions began some years ago. I have reported some experiences with this substance.[5] Originally, I treated chronic ulcers and some skin diseases with the fresh leaf of Aloe vera, obtained from Florida and the island of Aruba in the Dutch West Indies. However, it was difficult to obtain and preserve the fresh leaves and, after trial of ointments made in various ways, the two ointments that have been described were adopted. That made from Socotrine aloes is dark brown, and that made from Barbados aloes, nearly black. The dark color of aloes ointment is a disadvantage because it soils the dressings and unbroken skin, but not more so than the various dyes and other colored substances which are used in treatment. Surfaces where the ointment has been applied can be cleaned with benzine and the residue can be removed with rubbing alcohol.

Aloes, used either as the leaf or ointment, possesses distinct analgesic qualities. Removal of ointment dressings, as has been said, is painless. Dense, white scar tissue is not seen after healing of burns but the burned areas are reddish at first and remain smooth and pliable. Healing is rapid. Aloes possesses some enzymotic action; pus is apparently digested for purulent surfaces become clean. The drug is astringent, possibly because of the tannin it contains. It has styptic properties in fresh cuts, when applied as a powder. Antiseptic properties are indicated by the rapid clearing up of infected surfaces. When burns are treated by the method that has been outlined, infection is negligible.

It might be feared that absorption would give rise to unpleasant effects but I have noted no evidence of absorption. Stools have not been loose in any case. No undesirable effect was seen when powdered aloes was dusted in full strength, daily for a number of days, over the entire surface of large, chronic ulcers. Aloes is reputed to have abortifacient action but in treatment of one woman, eight months pregnant, the ointment was used for severe and extensive dermatitis caused by poison ivy and there was no evident effect on the uterus. Another woman four months pregnant, was treated with aloes ointment for severe pruritus vulvæ, without any untoward effect.

That this is not one of those measures which seems effective only in the hands of the one who advocates it is evident in the results which Collins[4] and Wright[6] have obtained with aloes in the treatment of roentgenologic injuries.

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CASE REPORTS

CREMASTERIC "TIC" WITH HYPERTROPHY OF THE CREMASTER MUSCLE*

JOHN R. McDONALD, M.D., and CHARLES W. MAYO, M.D.

Rochester, Minnesota

THE cremaster muscle takes its origin from the lower fibers of the internal oblique and transversalis muscles. "It passes along the lateral side of the spermatic cord, descends with it through the subcutaneous inguinal ring upon the front and sides of the cord, and forms a series of loops which differ in thickness and length in different subjects. At the upper part of the cord the loops are short, but they become in succession longer and longer, the longest reaching down as low as the testis, where a few are inserted into the tunica vaginalis. These loops are united together by areolar tissue, and form a thin covering over the cord and testis, the cremasteric fascia. The fibers ascend along the medial side of the cord, and are inserted by a small, pointed tendon into the tubercle and crest of the pubis and into the front of the sheath of the rectus abdominis."[3] The cremaster muscle is made up of striated muscle fibers. Its function is to draw the testis up toward the inguinal canal. It is rare for changes in the cremaster muscle to assume clinical importance, largely because of the non-essential nature of its function in civilized man.

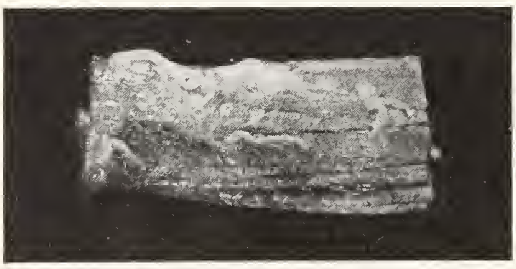

Fig. 1. Hypertrophy of the cremaster muscle. The muscle is approximately three times as large as normal.

The patient, a man aged forty-two years, had had mumps twenty-two years previously with resultant atrophy of the left testis. He was examined at The Mayo Clinic in 1926, at which time his right testis was large and the right cremaster muscle more developed than normal. The right testis was pulled toward the external inguinal ring. In 1929, he still complained of a drawing sensation in the right side of his scrotum. He returned in January, 1938. At this time he was bothered by twitching of his right testis. On examination there were regular twitchings, averaging ten to twelve per minute, involving the right side of his scrotum and jerking the corresponding testis toward the inguinal ring. Apparently both the dartos and cremaster muscles were contracting. At operation in April, 1938, one of us (Mayo) exposed the right spermatic cord and resected a segment 2 cm. in length of the cremaster muscle below the external ring.

Grossly, the resected portion was approximately three times the size of a normal cremaster muscle (Fig. 1). On microscopic examination, there were no significant changes aside from hypertrophy of the individual muscle cells (Fig. 2). The cross striations were normal and there was no inflammatory reaction. Although difficult to prove, there did not appear to be any actual increase in the number of muscle cells. The added work done by the cremaster muscle in contracting over a long time was undoubtedly responsible for the hypertrophy in this instance. The patient was examined one month after operation, at which time the twitching in the right side of his scrotum had disappeared completely.

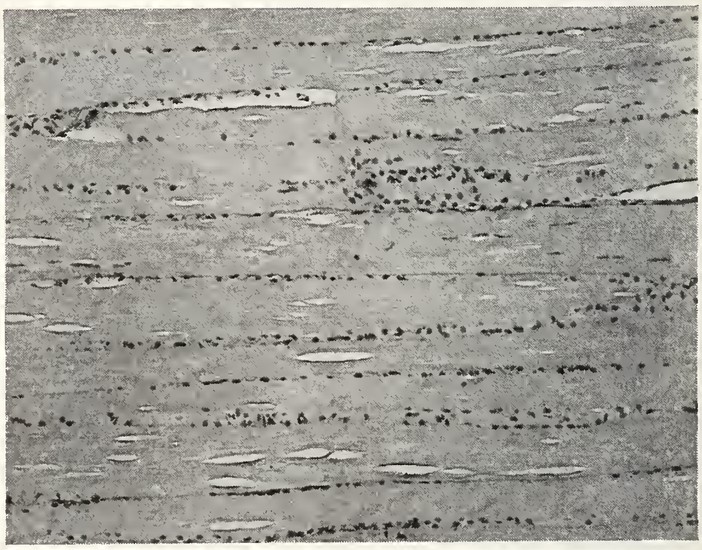

Fig. 2. Cremaster muscle from a case of cremasteric "tic." The individual muscle fibers show hypertrophy. Hematoxylin and eosin, x100.

Although tonic spasm of the cremaster muscle has been described, there have been few cases of clonic spasm in which regular contractions of the cremaster muscle were observed. It has been suggested by several investigators (Hamburger and others) that cremasteric spasm occurs as the result of an exaggerated cremasteric reflex. A number of cases of cremasteric spasm have been directly due to trauma, either locally in the region of the thigh or centrally to the spinal cord or brain. In the large majority of these cases a definite etiologic factor cannot be proved. Weir Mitchell, in discussing the cremasteric reflex, described a case in which a bullet wound in the thigh was followed by tonic spasm of the corresponding cremaster muscle. The testis remained drawn toward the inguinal ring for several hours. Cornil and Mosinger, in 1930, reported marked hyperactivity of the cremasteric reflex in two cases of injury to the spinal cord without any definite spasm of the muscle. Zuccarelli reported clonic spasms of the cremasteric muscle in a patient following a traumatic cranial injury. Hamburger described cases of hyperactive cremasteric reflexes with spasm, in which he felt the cause was psychogenic. In these patients an abnormally strong reflex could be elicited if the patient's thigh were touched or even if the patient thought that the examiner's finger was about to touch the thigh, although it did not do so. Talmud, in 1928, described a case in which the patient had a painful elevation of the right testis (Cremaster Krampfe). This was relieved by resection of the corresponding external spermatic nerve. Haberland reported a series of seven cases in which one or both testes were pulled up to the external ring. These cases were examples of hyperactive cremasteric reflexes, because stimuli to the lower part of the body were sufficient to induce such a spasm. He advised diathermy in the treatment. André-Thomas described two cases of retracted testis with exaggerated cremasteric reflexes. A case of hyperactive cremasteric reflex was reported by Kovalesky in 1925 in which both testes rose with inspiration and descended with each expiration.

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*From the Section on Surgical Pathology (McDonald) and the Division of Surgery (Mayo), The Mayo Clinic, Rochester, Minn.

Summary

A case of cremasteric "tic" has been described in which there were regular clonic spasms of the cremaster muscle with marked hypertrophy. Excision of a segment of the muscle effected complete relief.

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MARKED CARDIAC ENLARGEMENT FOLLOWING ACUTE CORONARY OCCLUSION*

HARRY L. SMITH, M.D., and GILES A. KOELSCHE, M.D.

Rochester, Minnesota

There is a disagreement among physicians as to whether or not coronary occlusion produces cardiac enlargement. A few years ago one of us (Smith) and Bartels reported two cases of marked cardiac enlargement following acute coronary thrombosis, with postmortem findings. In those cases it was believed that the enlargement was entirely the result of the infarction. We are reporting another case of marked cardiac enlargement because we believe that the enlargement was the result of previous coronary occlusion.

Report of Case

The patient was a salesman who was forty-two years of age. He had always been rather high strung and had worked under considerable tension. His general health had been good and he always had felt well. One year before he came to The Mayo Clinic, he had felt tired out after some strenuous work. He had been examined by his physician but nothing significant had been found. He had previously been in the habit of drinking a considerable quantity of mixed drinks. He had been advised to reduce his drinking. About this time the patient had noticed some skipped beats of his heart. There had not been any other symptoms of cardiac involvement. In April, 1935, he had had a cold in his lungs. He had coughed considerably. His temperature had been 101° F. for a few days and a lower degree of pyrexia had continued several days following this. There had not been any edema, cyanosis or pain in the thorax at this time. The patient had fully recovered from this attack and had returned to his former occupation feeling perfectly well.

In August, 1938, he had been feeling fine and had been working strenuously on a display at a fair. On one hot afternoon he had quickly drunk a bottle of a cold soft drink. Soon after this he had been seized with a severe pain over the lower part of the sternum. The pain had lasted approximately ten to fifteen minutes. He had been sitting when the pain had occurred and he had continued to sit quietly during the attack. The pain had recurred three times during the afternoon and early evening. The pain had not extended beyond the lower part of the sternum and there had not been any nausea or vomiting at this time. About 11 p. m. of the same day, he had had a sudden attack of very severe pain in the thorax which had extended down both arms. This had lasted about twenty minutes. The patient had felt weak and slightly nauseated. He had been at his home when this attack occurred. One hour later an excruciating pain had occurred in the same region and had extended down both arms. A physician who had been called made a diagnosis of acute coronary thrombosis. The patient had been put to bed in the hospital. He had remained there for two weeks and had remained in bed at home for six weeks more. He remembered that for about six months before the attack of severe pain in the thorax he had had slight anginal pains which had occurred after exertion.

The patient was well developed and well nourished. The value for the systolic blood pressure was 86 mm. of mercury and that for the diastolic pressure was 62 mm. The pulse rate was 84 beats per minute and the temperature was normal. Examination of the thorax disclosed that the heart was greatly enlarged, both to the left and to the right. Fundoscopic examination revealed normal ocular fundi.

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*From the Division of Medicine, The Mayo Clinic, Rochester, Minnesota.

The blood and urine were normal. A flocculation test was negative. Roentgenographic examination of the thorax revealed a heart shadow that extended 9.5 cm. to the right and 10 cm. to the left of the midsternal line. (Fig. 1). The transverse diameter of the thorax was 31 cm. (Fig. 2). An electrocardiogram revealed a rate of 80 beats per minute, sinus rhythm with slurring of the QRS complexes in derivations I, II and III, left ventricular preponderance, inversion of the T waves in derivation I, iso-electric T waves in derivation II, and inversion of the T waves and absent S waves in standard lead IV.

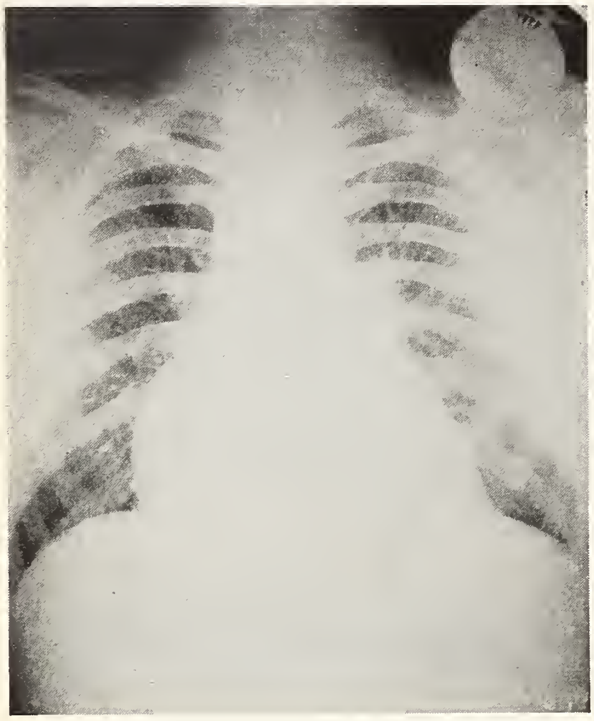

Fig. 1. Roentgenogram of the heart made four months after an attack of coronary occlusion; the heart is enlarged 9.5 cm. to the right and 10 cm. to the left of the midline and the transverse diameter of the thorax measured 31 cm.

Comment

In this case the patient was a traveling salesman who had had yearly examinations for the past five years before he came to the clinic. On each occasion the physical examination had failed to disclose any abnormality. His blood pressure had never been found to be above normal and on a few occasions he had been told that his blood pressure was low. There had never been any evidence that his heart was enlarged prior to the attack of acute coronary occlusion in August, 1938. Four months after the attack his heart was found to be markedly enlarged. We believe that the enlargement was mainly due to hypertrophy. There probably was some cardiac dilatation but we believe not a great deal because there was no evidence of cardiac failure. If this degree of enlargement were due mainly to dilatation, there should have been evidence of cardiac insufficiency. We think that the cardiac enlargement was the direct result of the myocardial infarction that occurred in August, 1938. We believe that we have excluded all other causes of cardiac enlargement. We do not think the patient had ever had hypertension as his retinal arteries were perfectly normal. If an elevated blood pressure in the past had been a factor in producing this cardiac enlargement, there should have been some evidence of it when the patient was examined at the clinic.

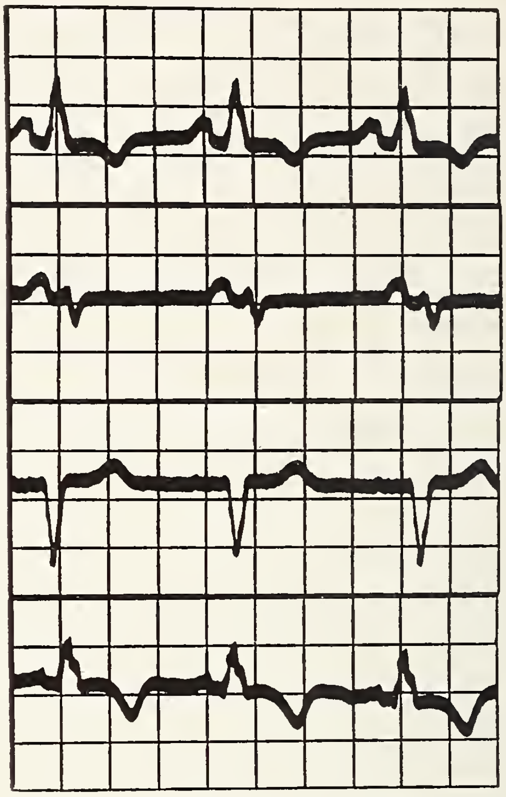

Fig. 2. Electrocardiogram made four months after an attack of coronary occlusion; this shows a cardiac rate of 80, sinus rhythm, left ventricular preponderance, inverted T waves in derivation I, iso-electric T wave in derivation II, inverted T waves and absent S waves in derivation IV (standard).

We have excluded valvular heart disease and pericarditis. We believe that acute coronary occlusion does not often produce cardiac enlargement, but that it occasionally produces marked cardiac enlargement. Just why it produces enlargement in some cases but does not do so in the majority of cases, we are not able to explain. There is a possibility that the size and situation of the infarction may be a factor in producing the hypertrophy, and there is a possibility that involvement of the cardiac septum may be a factor. We believe that the ultimate prognosis in such cases is bad.

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HISTORY OF MEDICINE IN RAMSEY COUNTY

BY J. M. ARMSTRONG, M.D.

(Continued from July issue)

BIOGRAPHIES

Hans Peter Gabrielsen

Dr. Hans Gabrielsen was a man of peculiar history. He was born in Rothberg, Schleswig-Holstein, apparently of a good family. He attended the gymnasium there and went to Kiel and later to Vienna to attend the clinics. He became involved at this time in the revolution of 1848, and there being no place for him in Germany, came to America and to Saint Paul in 1855. Instead of attempting to practice as a physician at that time, although not having a degree, he went into the saloon business, and, when that failed, opened a barber shop on the east side of Washington Street between Third and Fourth Streets, and was there when the war broke out. His name, however, is given in the directories of 1856-1857 and 1858-1859 as a physician. One must remember that in those days barbers in Germany did minor surgery, cupping, phlebotomy, et cetera, as well as applying leeches.

Doctor Gabrielsen enlisted as hospital steward and was appointed Assistant Surgeon to the First Minnesota Infantry, February 17, 1863, and was discharged with the regiment. When he took the examination for surgeon, Dr. J. H. Stewart was a member of the Board of Examiners. Instead of waiting to be asked questions, Gabrielsen began to pop questions to the Board and after their replies he said, "That's just what I would do," or "That's just what I think." They passed him. He returned to Saint Paul after the war, and being a modest man went back to his barber shop. In 1874-1876 he was elected coroner. He finally returned to Germany, where his pension enabled him to live without labor. He died in Hamburg in the home of a sister about 1902.

James Dinsmore Goodrich

Dr. James D. Goodrich was born at Ripley, Chautauqua County, New York, April 24, 1820, and came to Saint Paul in 1851. Before coming here he had lived and practiced medicine in Cleveland, Ohio. His health having failed, he gave up the practice of medicine for a year or more and was a sailor on the Great Lakes. The Northwest at that time was considered an excellent place for the tuberculous, which no doubt caused Doctor Goodrich to come to Saint Paul. He is described as of slight frame, unassuming, and attentive to business, though it is said he did not have much of a practice during his last years. He was St. Paul's first health officer and city physician in 1854 and coroner in 1857. He left Saint Paul in 1859 and died January 20, 1861, presumably at his former home in New York. At one time he was associated with Dr. O. P. Marsh.

Adelard Guernon

Dr. Adelard Guernon was born of French-Canadian parents in the Province of Quebec and died in Saint Paul, January 15, 1889, in his forty-fifth year. He obtained his medical education in Montreal and graduated in the spring of 1865, and was licensed by the Provincial Medical Examining Board of Quebec, the same year. In the autumn of 1865 he came to Saint Paul. He was coroner of Ramsey County in 1870-1872. After his term of office expired he moved to Little Falls. While there he held the position of County Superintendent of Schools for ten years.

In 1885 Doctor Guernon was appointed Collector of Customs for Minnesota and moved to Saint Vincent. In 1888 that office was removed to Saint Paul, and Doctor Guernon returned to his first location. He was married twice; his second wife was a daughter of Dr. E. E. Braun of Little Falls and previously of Saint Paul. Doctor Guernon died suddenly of angina pectoris.

Martin Hagan

Dr. Martin Hagan was born in Tuscarowas County, Ohio, December 28, 1832. He came to Saint Paul late in the year 1867. He attended the Cleveland Medical College, but obtained his medical degree from Starling Medical College in Chicago in 1859, and practiced at Port Washington, Ohio. After serving in the Army as Surgeon in two Ohio Volunteer Regiments, he went to New York and obtained a medical degree from the College of Physicians and Surgeons in 1867. He was an aggressive man and devoted a good deal of his time to politics, displacing Brewer Mattocks as city physician in 1871. In 1880 he was president of the Ramsey County Medical Society.

Just when Doctor Hagan left Saint Paul is uncertain, as he left once and then came back again. He went from Minnesota to the Sandwich Islands, where he got into the good graces of the King and became his physician. After a residence there for some time he returned to the United States and resided in Los Angeles, where he died June 23, 1901, at the age of sixty-eight years. An account of him may be found in the History of Medicine in California. A son, Ralph Hagan, is now a physician in Los Angeles. Doctor Hagan was at one time Ramsey County treasurer.

Daniel W. Hand

Although we have given a short sketch of Dr. Daniel W. Hand in the history, it is not out of place to repeat it, as we have given biographies of many men less prominent than he. As a matter of fact, Doctor Hand was for many years the most prominent physician in Saint Paul, and, perhaps in the state.

Daniel Hand was born at Cape May Court House, New Jersey, August 18, 1834, and died in Saint Paul, June 1, 1889. His record as a medical officer in the army, both as a field surgeon with the army of the Potomac and as an administrator, was unsurpassed. He was Medical Director of the Department of Virginia in 1863, and held the same office in North Carolina in 1864-1865. While in this latter office he combated an epidemic of yellow fever among the civilian population. Of his medical staff of eighteen during that epidemic, eight died of the disease, and although he contracted it himself he fortunately recovered. His success in combating this epidemic being recognized, he was, in 1866, detailed to take charge of an epidemic of Asiatic cholera among the troops. An account of these epidemics may be found in the War Department records. He was wounded in 1862 and was taken prisoner in 1863 and confined in Libby

Prison for a short period. After his retirement from the army with the brevet rank of Lt. Col. U. S. V., he returned to Saint Paul.

When the State Board of Health was organized in 1873, Doctor Hand became president of that board and held the office till the time of his death. Much of the excellent work done by the board has been credited to and taken credit for by others, though Doctor Hand was the real administrator and guide. He deservedly obtained and held a large general practice till the time of his death. He worked hard and faithfully for his patients, the public, and for the advancement and improvement of medicine.

George Martin Kellogg

Dr. George M. Kellogg was born in Chautauqua County, New York, June 20, 1829, and entered Oberlin College from Linden, Louisiana, in 1842, graduating A.B. in 1848. In 1852 he was graduated from the Ohio Medical College. During the year 1854-1855 he was lecturer at the Cincinnati Dental College. The Alumni Catalogue of Oberlin College of 1857 gives his address as Saint Paul, Minnesota Territory, and that of 1860, Keokuk, Iowa. He practiced medicine at Keokuk and also was a professor in the Keokuk Medical College.

Doctor Kellogg served as an army surgeon during the Civil War and subsequently acted as United States Pension Examiner. He also practiced at Nauvoo and Carthage, Illinois, and for a time in Chicago. From there he moved to Las Vegas, New Mexico, in search of health. In the early nineties he returned to Keokuk but shortly afterward located in Prescott, Arizona. He died at Pasadena, California, August 18, 1905. He was married on June 20, 1866, to Sarah W. Barker, who with their two daughters survived him. The Catalogue of the Surgeon General's library lists several titles of medical articles by him.

L. C. Kinney

An examination of the records of the Adjutant General's office, War Department, shows that Dr. L. C. Kinney served as Acting Assistant Surgeon, U. S. Army, under contract, from December 3, 1847, to June 16, 1848, when the contract was terminated. During that period he was stationed at Jalapa, Mexico, and at the time his contract was signed, he stated his residence to be Bridgeport, Kentucky. Nothing additional has been found relative to his army service or personal history, except that he was living in Walla Walla, Washington, in 1869. Whether he practiced medicine there is not known. He had given up the practice of medicine before he left Saint Paul.

Frank Lawson

Dr. Frank Lawson was born in January, 1838, at Cove Head, Prince Edward Island. He attended Harvard Medical School from 1863 to 1865, receiving his degree the latter year, and again attended that school in 1869-1870. On February 4, 1865, he began service as Contract Surgeon in the United State Army and was assigned to duty with the 38th U. S. Colored Troops. His contract was annulled May 8, 1865. He then practiced for five years at Mount Stewart in his native province. He came to Saint Paul in 1870 and was one of the founders of the Ramsey County Medical Society. He remained in Saint Paul but a short time and then began practice at Osseo, Minnesota, where he remained till 1877. At that time he returned to Prince Edward Island and located at Centreville, where he died December 28, 1877.

Thomas Theodore Mann

Dr. T. T. Mann, who was elected corresponding secretary of the Minnesota Medical Society in 1853, was born in Philadelphia in 1816. He was the son of Captain Daniel Mann of Providence, Rhode Island, who was lost with the brig *Hornet.*

After graduating, presumably at the University of Pennsylvania, Doctor Mann spent some time abroad and on his return held some minor public health position in Philadelphia. Because of ill health he took a journey to the Great Lakes and was physician to a copper mining company in Michigan for a year. Going to Fond du Lac, he decided to return to Philadelphia by the Mississippi and Ohio Rivers. Taking the route to the Mississippi used by the aborigines for centuries, he arrived in Saint Paul via the Brule and Saint Croix Rivers to Stillwater. As he had some money, and opportunities for investment seemed propitious and the climate agreed with him, he stayed. He was correspondent for the *New York Tribune* and many of his articles were republished in the *Pioneer.* After Goodhue's death, he conducted the *Pioneer* till a purchaser was found. He later married Mrs. Goodhue.

Doctor Wharton stated that Mann never practiced in his time. In the Ramsey County Medical Library there are several books bearing his autograph. The writer, when a small boy, often saw him. He was a tall stoop-shouldered man then with gray hair and a beard. The time of his death was about 1884. He lived for a time at Cottage Grove, where he had a farm, and for many years preceding his death, on the southeast corner of Summit Avenue and Fourth Street. The exact location is now occupied by the street, due to the moving south of that part of Summit Avenue. He was in feeble health for many years (a confirmed opium user), and was notorious for his penuriousness.

Brewer Mattocks

Dr. Brewer Mattocks came to Saint Paul with his father, the Rev. John Mattocks, from Keeseville, New York, in 1856. He attended the Philadelphia College of Pharmacy, and after his course there he returned to Saint Paul. At the outbreak of the Civil War he enlisted as Hospital Steward in the Second Minnesota Volunteer Infantry, and later became Assistant Surgeon in the Seventh Regiment. While in the Army he was stationed in one of the army hospitals in Saint Louis, and had the opportunity of attending the Saint Louis Medical College, from which he received his medical degree in 1864. After his discharge from the Army he began the practice of medicine in Saint Paul. He was city physician and health officer from 1867 to 1871 and again from 1874 to 1880, and county physician from 1874 to 1882. At the end of his term of service as county physician he moved to Faribault, where he practiced medicine till he retired in the year 1900.

Doctor Mattocks was one of the founders of both the State Medical Association and the Ramsey County Medical Society. He was the last surviving charter member of both organizations. In 1871 he published a small book, "Minnesota a Home for Invalids," printed by J. B. Lippincott, Philadelphia. This was the first medical book published by a physician resident in Minnesota. He also wrote a book of poems and a novel. Doctor Mattocks resided at the Soldiers Home in Minneapolis during his last years. He died February 25, 1934, in his ninety-third year, having been born in Tuesdale, New York, September 9, 1841. His manuscript diaries during the Civil War years are in the library of the Minnesota Historical Society.

Ebenezer Miller

Dr. Ebenezer Miller was born at Vernon, Vermont, October 4, 1822, and graduated from the Castleton Medical College in 1843. He practiced a year at Guilford and for eleven years at Halifax, Vermont, and came to Saint Paul in October, 1857. In 1863 he left Saint Paul and opened a drug store in Natchez, Mississippi, and died July 21, 1865, in Homer City, Louisiana. Nelson D. Miller, for many years chief engineer for the Great Northern Railway, was his eldest son. Dr. Clinton C. Miller, who was a member of the Ramsey County Medical Society, and Lucia Miller, for many years principal of the Webster School in Saint Paul, were also his children. Doctor Miller never practiced medicine in Saint Paul. At one time he was a deputy in the Sheriff's office.

William H. Miller

Dr. W. H. Miller was born in Prussia in 1811. The time of his arrival in America does not seem to be recorded. Before coming to Saint Paul in 1854 he had lived in Saint Louis, and as his place of business was near the levee, he is said to have been known as the "Steamboat Doctor." He opened a small drug store here on St. Anthony Street, nearly opposite the American House, and later moved to a frame building on the northwest corner of Third and Exchange Streets. The three story brick building later built by him on the same site is still there. He was an excellent botanist and collected many of his medicinal plants himself. Whether he was a medical graduate is doubtful, though no doubt he was a graduate apothecary. He did quite a business among the German residents, and was most economical and methodical in his habits. The late Ferdinand Willius told the writer that for thirty years preceding his death Doctor Miller never failed to deposit something every week day in the old German American bank. He accumulated considerable property.

The older druggists say that crude drugs that could be obtained no other place in Saint Paul could always be found at Miller's. Doctor Miller deplored the passing of vegetable drugs and was an authority on the action of many of them. He wrote several of the articles on vegetable drugs for the United States Dispensatory, and those articles have been reprinted in successive editions with scarcely any change. He also contributed to the Homeopathic Pharmacopœa. He died in Saint Paul in 1884. His eldest son, Adolf Miller, preceded Brewer Mattocks at the Philadelphia College of Pharmacy and later became Professor of Pharmaceutical Botany at the University of Pennsylvania.

L. B. Morrow

Dr. L. B. Morrow came to Saint Paul about 1855 and clerked for Elfelt Brothers. He enlisted in the army as a hospital steward in the Fourth Minnesota Regiment and served from 1862 to 1865. Whether he ever graduated in medicine is unknown. Probably he studied with Dr. J. H. Murphy, as he married Doctor Murphy's sister-in-law. He practiced medicine at Shakopee and Faribault, and later was associated with Dr. Otis Hoyt at Hudson, Wisconsin. He lived in Saint Paul in retirement for some years before his death, about 1911.

(To be continued in September issue)

President's Letter

DURING the summer months we have been concerned with our relations with other health agencies in the state. Last month we dealt with the University in its various contacts with the practicing profession. This month, we come to the State Board of Health. Co-operation with the Board in Minnesota has been very close. Doctor Chesley and his staff have met repeatedly with the officers and with the Council to discuss problems of mutual interest. In Minnesota, the policy has been to emphasize the free choice of doctor on the part of the patient and to assist the doctor as far as possible with diagnostic and treatment aids. Pneumonia typing and serum has been an outstanding example of this policy during the past year. General laboratory and diagnostic service for blood reactions has continued to a larger degree than ever before.

No one has rendered greater assistance in the program of the month than the State Board of Health. The department also was most active in preparations for the last state medical meeting, particularly in its Public Health Exposition, and the thanks of our members were officially expressed for this aid by the House of Delegates at the meeting.

We understand that the State Board of Health will carry on a campaign of venereal disease postgraduate short courses next fall. Postgraduate courses in Minnesota have been of great value and we believe that this step on the part of the State Board of Health is in the right direction. We are sure, furthermore, that the medical profession will take full advantage of these courses.

George Earl, M.D., *President,*
Minnesota State Medical Association.

EDITORIAL

MINNESOTA MEDICINE

Official Journal of the Minnesota State Medical Association

Published by the Association under the direction of its Editing and Publishing Committee

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BUSINESS MANAGER
J. R. Bruce

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DR. WILLIAM J. MAYO

ALTHOUGH the many friends and admirers of Dr. William J. Mayo had known of the serious operation he had undergone in the early spring, news of his death on July 28, 1939, came as a real shock. The termination of this outstanding career only a bare two months following that of his brother, Dr. Charlie, seems almost foreordained. These two lives, so inseparably associated professionally, have almost simultaneously ended.

Minnesota physicians have been especially proud of the success attained by the Mayo brothers—success not measured in financial terms but in the building up of a large medical institution, not only for the treatment of the sick but for the education of young doctors. The guiding genius of any such organization required not only an outstanding surgeon but an organizer and administrator as well. Such leaders are of the same caliber as presidents of large corporations, railways and banks, and require a type of man that is rare. Such an unusual individual was Dr. Will Mayo. Not taking over an already established institution, his was the recognized guiding brain that built from the foundation the institution known as the Mayo Clinic, showing unusual judgment in the selection of assistants, most of whom developed in their various specialties at the Clinic.

The unusual respect afforded Dr. Will by the medical profession could not have resulted from mere devotion to personal affairs and the development of the Clinic, however high the purpose of his program. He had a broad viewpoint as shown by his untiring attention to the affairs of the profession at large. He gave his time unstintingly to the development of medical and surgical organizations, and many of the plans for the interchange of ideas and the dissemination of medical knowledge were in an appreciable part the product of his fertile brain.

The life story of Dr. Will is full of work, full of success, academic recognition, rewards tangible and intangible, to a degree that seldom comes to any man. All of this could not have occurred had he not had as a basis a sterling character in himself, a fine example in his father, the support and advice of an accomplished brother.

History will of course record Dr. Will's contributions to the progress of medicine; but a host of people not only physicians and students but the laity as well who have sought his advice, will remember the personal manner of cordiality and interest extended to all those with whom he came in contact.

SULFAPYRIDINE IN UROLOGY

Recently another new drug, sulfapyridine, has been recommended in the treatment of gonorrhea. Workers in England have reported excellent results following its use, and at The Mayo Clinic our limited experience with the drug seems to confirm these observations.

Certain important facts concerning its administration must be remembered. In the treatment of gonorrhea, a much lower dosage is required than is used in the treatment of pneumonia. Consequently, many of the toxic manifestations which so frequently accompany large doses of the drug are minimized or completely absent when reduced dosages are employed. It is not this question which disturbs the urologist. The analysis of the patient's progress and the results obtained are of much greater significance.

In almost all cases reported, objective signs of neisserian infection have disappeared within a week after the administration of the drug was begun. The discharge usually disappears, the urine is clear, and any subjective symptoms will have disappeared. Such a situation may lead to a false sense of security on the part of both the physician and the patient. Time alone will tell what havoc may be wrought if the physician will not appreciate this problem and do what he can to make the patient aware of the fact that the apparent cure may not be real. Fortunately, competent and adequate local treatment when satisfactorily administered will greatly shorten the duration of the disease and is an excellent means of keeping in touch with the patient. The problem involved must be made clear to our patients, and any physician treating patients who have this disease should not attempt such therapy unless he himself fully understands this problem and is willing to take time to enlist the complete coöperation of the patient. Only then can this drug, or any other, be an asset and not a liability to the physician's armamentarium.

Edward N. Cook

From time to time our attention is called to the presence in a certain locality in the state of a salesman purporting to represent a certain company, receiving orders and a cash payment from a trusting member of the medical profession and failing to deliver the goods. The answer is that we would be wise never to give cash or check payable to a stranger when ordering goods. After having been tricked once in such a way, one is not likely to be fooled again.

At the annual meeting of the House of Delegates in June, the Council was authorized to increase the size of the Editing and Publishing Committee of the Journal from five to ten. In the future, two members will represent Minneapolis, Saint Paul, Duluth and Rochester and the state at large, two to be appointed each year and each to serve for five years.

The new appointees are Dr. O. W. Rowe, Duluth; Dr. H. W. Meyerding, Rochester; Dr. P. F. Donahue, Saint Paul; Dr. C. L. Oppegaard, Crookston; and Dr. B. O. Mork, Jr., Worthington.

MINNESOTA HOSPITAL ASSOCIATION

Assurance that the Minnesota Hospital Service Association would continue to give full security under the terms of its contracts to 300,000 members and dependents now protected wholly or in part against hospital bills was given recently by E. A. Van Steenwyk, Executive Secretary of the Association.

"The Minnesota Hospital Service Association is not now and never has been in the insurance business. It was started and maintained by the voluntary hospitals themselves only with the idea of furnishing hospital care to employed men and women and their dependents at cost when needed," Mr. Van Steenwyk said.

His statement came following the filing of a suit in Ramsey County District Court by three contract holders who sought to secure an injunction against the Association's making out further contracts on the basis that the Association actually is selling insurance and has not complied fully with insurance regulations of the state.

"The Minnesota Hospital Service Association is a non-profit organization owned and operated by 25 hospitals in the Twin Cities, Duluth, and Stillwater," Mr. Van Steenwyk said. "Every day there are about 700 persons in these hospitals whose bills will be paid wholly or in large part by the Association. The hospitals themselves pledge their entire physical assets to give hospital care when needed.

"The Minnesota Hospital Service Association contracts are service contracts guaranteeing the delivery of hospital service to subscribers when they need it. The Service Association in its six years of operation has hospitalized 50,000 subscribers at a cost of more than one and a half million dollars. It has also set aside nearly $400,000 as a reserve against unusual hospital needs of subscribers. This reserve while adequate is not excessive since the hospital bills each month total

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*The above explanation submitted by the Minnesota Hospital Association is reproduced for the enlightenment of our readers.

nearly $100,000. A reserve equal to four months hospital demand is regarded as safe but not excessive.

"The Minnesota Hospital Service Association contract is really a contract between 25 hospitals and each individual subscriber. The hospitals guarantee delivery of the service, the subscriber agrees to pay 75 cents a month, if single, $1.00 a month if married. There is no reason for alarm on the basis of the suit filed in the Ramsey County District Court by Norma Schlief, John A. Currie, and C. W. Nelson charging that the Minnesota Hospital Service Association is an insurance company and asking that the Association be restrained from doing further business.

The Minnesota Hospital Service Association is set up as a community enterprise—exactly as all non-profit hospital service plans in the United States. Its trustees serve without pay—no profit is gained by anyone except subscribers. The only difference in Minnesota is the fact enabling legislation which has been passed in approximately twenty-five states has not been adopted here. Such legislation placing the Association under the supervision of the Department of Insurance was sponsored by the Minnesota Hospital Association during the past two sessions. The Minnesota Hospital Service Association in every respect meets the requirements of the American Hospital Association, the standardizing agency for all non-profit plans in America. It is the only Association approved in Minnesota.

"The Minnesota Hospital Service Association is regarded as a model plan nationally. It is one of the strongest financially, the "Blue Cross" card it provides each subscriber being recognized by hospitals of standing from San Francisco to Maine. The Association operates soundly at the lowest cost per subscriber served of any such plan; at the present time, 89 cents out of every dollar collected being available for either current hospital needs or reserves to meet such needs. The current hospitalization demand is approximately 75 per cent of current income.

"The Minnesota Hospital Service Association during its history has made four successive increases in service available to subscribers. Surplus funds under the original Articles of Incorporation and the Inter-Hospital Agency contract can only be distributed in this way. Out of town service to $5.00 a day was made available only after sufficient reserve had been established so that the funds of the Association would in no way be imperiled.

"The plaintiffs claim that because of this humanitarian service the Association should be restrained from doing business.

"One of the bases for the plaintiffs demanding that the Association be restrained from doing further business is the fact that this extension of its services to take care of persons injured in automobile or other accidents or overtaken suddenly by a serious illness while far away from home and perhaps without funds, was provided. I want to state emphatically that the Association in meeting the needs of such subscribers did so to promote public health. Actually, subscribers prior to the time when this service was available, at great risk to their own health, asked to be driven from the scene of accident or after they had been stricken by illness to a Minneapolis or St. Paul hospital where service was available to them without cost when really they should have been hospitalized in a hospital in the community where they were injured or became ill. Thus, charges filed by subscribers who themselves stand to benefit by the liberal attitude taken by the local hospitals must be put down to gross indifference to community health needs or to misinformation on their part.

"Actually, of 20,249 cases hospitalized in 1938, only 254, or 1.3 per cent, were hospitalized in other than member hospitals. Of the $585,338 paid to hospitals last year for the care of subscribers, only $6,584, or 1.1 per cent, was paid for those hospitals outside of member hospitals.

"The Minnesota Hospital Service Association is simply an extension of the non-profit hospitals in the community. It holds no secrets, it has kept its subscribers, the hospitals, the medical profession, the insurance commissioner's office, and the Attorney General of the State fully advised with respect to all of its actions and financial position. In view of the circumstances, and the long record of useful service to the community, there is reason to question the good faith of those instituting the suit."

OF GENERAL INTEREST

Dr. Gilman H. Goehrs, who is a recent graduate, has joined the Goehrs, Rathbun, Ernst Medical Clinic at St. Cloud.

* * *

Dr. Francis Chermak, formerly of Hibbing, has become associated in practice with Dr. R. F. Werner at International Falls.

* * *

Dr. L. N. Casmey of Crookston has moved to Ulen, Minnesota, where he will take over the practice of the late Dr. E. A. Bothne.

* * *

Dr. Thomas E. Eyres of Des Moines, Iowa, has recently moved to Pequot, Minnesota, where he has established offices for the practice of medicine.

* * *

Dr. Donald C. Balfour, Rochester, was presented with an Honorary Fellowship in the Royal College of Surgeons of England, in London on July 13, 1939.

* * *

Dr. Arthur C. Kerkhof and Dr. O. L. Norman Nelson have opened offices at 601 Medical Arts Building, Minneapolis, for the practice of internal medicine.

* * *

Dr. H. T. Sherman has disposed of his practice at Spring Valley to Dr. L. W. Katzberg, formerly of Fergus Falls, and is now located in Mantorville, Minnesota.

Dr. Donald F. Stewart, a graduate of the University of Minnesota Medical School, is now associated with Drs. H. E. Binet and C. M. Erskine of Grand Rapids.

* * *

Dr. Albert Balmer, who recently completed his internship at Ancker Hospital, Saint Paul, is now associated in practice with Dr. E. F. McElmeel in Pipestone, Minnesota.

* * *

Dr. Walter B. Kaufman, formerly resident physician of the Baltimore Eye, Ear, Nose and Throat Hospital, Baltimore, Maryland, is now practicing medicine at Mankato, Minnesota.

* * *

Dr. Nathaniel Lufkin, formerly on the staff of the Minneapolis General Hospital, began his duties as chief pathologist and director of laboratories at St. Barnabas Hospital on July 1.

* * *

Dr. R. R. Hendrickson of St. Cloud, who for some time has been the physician at the St. Cloud Reformatory, has been elected superintendent of the Buena Vista Sanatorium at Wabasha.

* * *

Dr. John A. Williams, son of Dr. and Mrs. A. B. Williams of Saint Paul, has recently located at Slayton for the general practice of medicine and surgery. He will be associated with his uncle, Dr. L. A. Williams.

* * *

Dr. Clement C. Clay assumed his duties as medical director of St. Barnabas Hospital, Minneapolis, on July 1. Dr. Clay comes to his new position from Chicago where he has been assistant director of University Clinics, University of Chicago.

* * *

Dr. Lorin M. Olson, of Warren, has taken over the practice of Dr. L. F. Wasson of Chisago City. Dr. Olson is a graduate of the Gustavus Adolphus College and Northwestern University, and received his hospital training at Augustana Hospital in Chicago.

* * *

The wedding of Dr. Hjalmar Mortensbak of Hanska, Minnesota, and Miss Muriel Swihart of Balaton was solemnized in Saint Paul, June 3, 1939. Dr. and Mrs. Mortensbak are now at home in Hanska, following a trip through Yellowstone Park and other western points.

* * *

Dr. Manford B. Dahle, recently of St. Ansgar's Hospital, Minneapolis, has located in Warroad for the general practice of medicine. Dr. Dahle attended Concordia College, the University of North Dakota, and graduated from Rush Medical College of the University of Chicago.

* * *

Dr. B. J. Bouquet and Miss Dorothy Miller, both of Wabasha, Minnesota, were married June 7, 1939. Following a trip through the East and Canada, Dr. and Mrs. Bouquet will be at home in Wabasha, where Dr. Bouquet is associated in practice with Dr. C. G. Ochsner.

Dr. P. Cook, who recently completed his interneship at Ancker Hospital, Saint Paul, has become associated with Dr. W. C. Bernstein of New Richland. Dr. Cook is a graduate of the Northwestern University School of Medicine. He will be remembered as Minnesota Public Links Golf Champion of last year.

* * *

Dr. E. N. Nelson of Cashton, Wisconsin, has opened offices in Lake Park for the practice of medicine. Dr. Nelson is a graduate of the University of Cincinnati, spent some time as interne at the Cincinnati General Hospital, and a year at the Swedish Hospital in Minneapolis and the Gunderson Clinic at Madison, Wisconsin.

* * *

Dr. John Mickelson, graduate of the University of Minnesota, has just completed a year's internship at Jersey City Medical Center and Margaret Hague Maternity Hospital, Jersey City, N. J., and has joined the staff of the Mankato Clinic as general practitioner and obstetrician.

* * *

Dr. Vernon L. Hard, Minneapolis, was awarded the gold medal offered by the Southern Minnesota Medical Association for the best scientific exhibit at the recent meeting of the Minnesota State Medical Association. His winning exhibit was that of x-ray films of unusual fractions.

* * *

We are informed that a young man by the name of Chester Wainwright has been soliciting subscriptions to a publication called "College Years" among the profession in the Twin Cities. He stated that he is a graduate of Phillipps Academy at Andover, and of Harvard, and by obtaining a certain number of subscriptions he would be entitled to finish his medical education at any place he might elect. Upon inquiry it was found that he never attended Andover.

* * *

Dr. Russell H. Frost, son of Dr. and Mrs. E. H. Frost of Willmar, has resigned his position as superintendent and medical director of Buena Vista Sanatorium at Wabasha, Minnesota, and has accepted the position of superintendent and medical director of the new G. B. Cooley Sanatorium at Monroe, Louisiana. Dr. Frost will assume his new duties on October 1, but will go to his new location in August to make preliminary preparation for his work in the new institution.

* * *

Dr. J. A. Hilger, son of Dr. David Hilger of Saint Paul, began practice in association with his uncle, Dr. Andrew Hilger, at 441 Lowry Medical Arts Bldg., Saint Paul, on July 1, 1939. Since finishing his internship at Ancker Hospital Dr. Hilger has completed two years of post-graduate study at the University of Minnesota Medical School, where he had a teaching fellowship in diseases of the ear, nose and throat and in bronchoscopy, receiving his M.S. degree this spring. Dr. Hilger will limit his practive to ear, nose and throat and bronchoscopy.

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
W. F. Braasch, M.D., Chairman

FURTHER DEVELOPMENTS REGARDING THE WAGNER HEALTH BILL

Senator Murray of Montana, Chairman of the Senate Committee in charge of the Wagner Health Bill, announced several weeks ago that no attempt would be made to have the bill enacted at this session. With a sigh of relief, believing that federal attempts to control medicine were blocked for the time being, many of us hoped that we might relax and enjoy a quiet summer. Much to our surprise, however, an assault came from an entirely different and unlooked-for angle.

Flank Attack

It seems that the same well-meaning but misguided Senator Wagner, immediately after Senator Murray's announcement, introduced an amendment to the Social Security Bill which embodies many of the objectives of the Federal Health Program included in the Wagner Health Bill. Although the language is quite different and the amount of money involved is very much less, yet a careful review made by the Bureau of Legal Medicine of the American Medical Association showed that many features objected to by the House of Delegates are retained in the proposed amendment. It was also disclosed that if this amendment is passed by the Senate it will go to a conference of the House and Senate for adoption and will not be given a public hearing. Our attention in Minnesota was called to this flank attack by a letter written by a member of the House of Delegates of the American Medical Association requesting the endorsement of the proposed amendment.

By Political Sleight-of-Hand

The ways of a politician are often hard to understand. Well aware of the objections to the Wagner Bill by a large number of intelligent laymen and by an overwhelming majority of the medical profession, its proponents tried to put over many of its provisions by sleight-of-hand methods. It is also strange that so evident a subterfuge should be supported by any representative of organized medicine. It is probably true that there are some who are quite sincere in their belief that some form of federal control of medicine is advisable. In holding such beliefs, however, they should make public their position and not try to hide it under the guise of supporting the American Medical Association.

After receiving the analysis of Senator Wagner's amendment, the senators from Minnesota were informed as to our attitude and requested to seek further information before committing themselves.—W.F.B.

IS THE PUBLIC ENTITLED TO INFORMATION ON MEDICAL PROBLEMS?*

Scarcely does one enter a group of doctors without encountering a conversation about the proposed regimentation of medicine or complaints about administrative bodies who are limiting the free choice of physician, decreasing the allowance for medical care, or attempting to hire physicians at ridiculously low stipends.

Defenseless Doctor Discovered

It is apparent that a group of the population is financially distressed and should be helped. Other groups, however, animated only by selfish or political reasons, believe that the government, whether national or local, or the doctor, should supply medical care so that they can avoid paying for their care. So-called philanthropic individuals, associations, job seekers and ambitious politicians have suddenly discovered that the doctor of medicine is a defenseless creature and that their ambitions can be realized by discredit-ing him and his work. Although years have been required to develop the science of modern medicine and the doctor has sacrificed to obtain his education and stands ready to render service night or day, irrespective of who calls him, a malicious propaganda has been instituted by lay journals.

Do our professional ethics bind us only to grumble in private, or are we entitled to educate the laity concerning the importance of modern medicine in everyday life? Should we not enlighten the public on the fallacies of the many proposed schemes of regimentation? We are all inclined to leave this responsibility to a few, thinking, perhaps, that the other fellow can do it so much better than ourselves. Too often, when questioned, we reply only that we are opposed to government medicine instead of supporting our objection by a rational argument. I believe the real reason for failing to give a rational argument for our objections is lack of information.

Every Physician Must Do His Part

Malicious propaganda concerning the doctor has taken on such proportions that the few can not cope with the situation. It now becomes the duty of every physician to do his part in educating the public. This can be done by the doctor and his wife in individual contacts, in family groups, in clubs and public gatherings. We are in a noble profession; let us see that it is practiced ethically and then let us not be ashamed to explain to friends why there is so much discussion about socialized medicine. Let us inform ourselves concerning the various medical problems and be prepared to defend medicine as it is practiced today.

Minnesota Is Not Negligent

The secretary and executive secretary of the state medical associations are your servants, who are willing to assist you in obtaining information that you may desire. Dr. Meyerding, of the Minnesota Public Health Association, and the Public Health Committee of the Minnesota State Medical Association are anxious to help arrange public health meetings. The University of Minnesota, through its Center for Continuation Study, under the direction of Dr. O'Brien, is conducting frequent study courses in medicine for those who wish graduate work. Dr. Chesley, Director of the Minnesota State Board of Health, is always willing to coöperate with Minnesota physicians in supplying information concerning the activities of the board. Let us encourage our friends to listen to radio talks on medical subjects.

Minnesota is not negligent in medical care. We must coöperate with social agencies, lead them instead of having them dictate to us.

—A.W.A.

EDUCATIONAL OPPORTUNITY

A short time ago I was present at a meeting of interns who were just finishing their hospital service. Several staff men of assorted ages—young and old—were also in the company. The conversation turned on the much discussed subject of Socialized Medicine and it was interesting to hear the rapid fire of questions and the eager efforts to get in a word in answer. The activities of the Gannett Committee and its fine educational work were discussed.

The chief hope of one young physician just finishing his internship was that he should be able at once to "make a living" practicing medicine. The lure of a Government job with a salary attached was one of the subjects under discussion. Little by little it was developed that after paying office rent, car upkeep and other miscellaneous expenses, not much government income would be left and part of it later would have to go for taxes to pay for the system. The system, furthermore, would have high salaried political appointees laying down rules for doctors to follow.

Each intern had something to say about his attitude on Social Medicine and not one present was in favor of it. Other phases were discussed and during the evening one of the younger practitioners remarked that it was the first time he had sat down with his confreres and talked this matter over. He said he had learned much more about the subject than he had known before.

It occurred to the practitioners in this group that we might be missing an opportunity to solidify medical opinion. All the pros and cons of the subject can be thoroughly discussed in small informal groups, whereas formal discussion before large audiences often fails to bring out desired information.—A.N.C.

DAKOTA FAILURE

Farm Security Administration officials have appeared repeatedly before the Council and Committee on Low Income and Indigent Problems during the past year asking for a health insurance plan for farm clients in Minnesota.

In view of the fact that the success of the plan in North Dakota was cited as incentive for similar action in Minnesota it is of interest to note that the North Dakota plan was terminated at midnight on June 30 and that it was termed a failure.

The reason reported in the newspapers for the failure was the dissatisfaction of the physicians with the fees paid for their services.

The Committee on Low Income and Indigent Problems, of which Dr. W. A. Coventry of Duluth is chairman, was instructed by the Council to consider the proposal. The committee deferred action for further study and a chance to see how the plan worked out in other states.

The wisdom of this course is evident in the latest news from North Dakota.

Fees Dwindle

Pooled funds are easily dissipated and the amount that remains for the physicians who supply the essential service inevitably dwindles. At best, the government requirements for complete rehabilitation of client families is hardly justified at the small six months premium guaranteed.

Steady progress along conservative, well tested lines still appears to offer the best assurance for good medical care of all of the people in Minnesota.

"MICHIGAN MEDICAL SERVICE"

A news release from the Michigan State Medical Society dated July 16 declares that articles of incorporation for "Michigan Medical Service" have been filed with the Commissioner of Insurance by officials of the society.

Michigan Medical Service, according to the news bulletin, embodies the voluntary group medical care plan which is the result of ten years' study by the society. An enabling act in the 1939 Legislature to permit this type of nonprofit service to the people was sponsored by the medical profession of the state and the incorporators are A. S. Brunk, Detroit; Henry R. Carstens, Detroit; Burton R. Corbus, Grand Rapids; L. Fernald Foster, Bay City; Wilfred Haughey, Battle Creek; William A. Hyland, Grand Rapids; Henry A. Luce, Detroit; Vernor M. Moore, Grand Rapids; Ralph Pino, Detroit; Philip A. Riley, Jackson; and Paul R. Urmston, Bay City.

Complete organization work is not yet finished, it was announced, but the Service will act as agent to enable groups of Michigan residents to procure medical service in the home, the physician's office and the hospitals of the state with free choice of physician for the patient. The State Insurance Department will have full regulatory power over this non-profit medical service.

VENEREAL DISEASE POLICY IN MINNESOTA

The probability that increased funds will be made available to the State Board of Health for its venereal disease program lends a special interest to Minnesota's program and the policy of the State Board of Health.

The fact is that Minnesota was carrying on a consistent and effective program when little or no attention was given to venereal disease control in many other parts of the United States. Since venereal disease control became a popular cause, with the outspoken publicity and widespread public campaigns of the last few years, Minnesota has continued quietly and steadily on its own established program, using new funds to expand and strengthen already established lines of work.

No Clamorous Campaigns

Free clinics and clamorous campaigns for general Wassermann tests—evidences of activity in some other states—have been avoided on sound grounds in Minnesota. But the absence of dramatic developments has called the State Board of Health into question in some quarters.

Minnesota's excellent record in venereal disease control has heretofore been the effective and incontrovertible answer to critics. Will the Board of Health be able to continue its sound and effective program in Minnesota after it accepts the new funds that will undoubtedly be available to it through the most recent appropriation by Congress?

Policy Approved

The policy, which was proposed by Dr. A. J.

Chesley, executive officer, to the Council and approved by the Council after careful consideration indicates that no essential change is contemplated.

New funds will be used in much the same manner as previous funds have been used. By an error in reporting proceedings of the Council in these columns last month it was stated that some of this money might be available through the State Association for treatment of needy cases. Such a plan was considered carefully and rejected; but attention of all physicians was called to the fact that relief funds are available in most counties to pay for treatment of indigent patients.

WHY INSURANCE COSTS

(Monthly Editorial prepared by the Medical Advisory Committee)

Today as yesterday, and through the ages which have passed, the study of the economics of the human family has evolved around the familiar phrase "Supply and Demand."

Economics and their various phases take up a good share of all of our waking hours and he who is not familiar with their laws finds himself lost in a maze, a world in which both the old and the young must each one learn anew the secrets of effective living.

In our economic life, insurance of one kind or another plays a great part and gives to the one who buys a policy the assurance of being protected against unforeseen risks and unwanted catastrophes of various kinds.

The cost of this protection, as specified in the premiums paid, is, of course, based in great part on the hazards involved and surrounding the holders of these policies. The greater the hazard, naturally, the larger the premium paid, and, conversely, the less the risk, the smaller the cost.

Many times, a large group pays amounts that are less than the individual's because of a blanket protection afforded to all in the group. The hazard is lessened and the cost can be distributed.

Your Medical Advisory Committee believes that the type of protective policies written by the present companies authorized to write malpractice insurance in Minnesota can well supply the demand of the members of our Association for such policies; but that each member of our Association must constitute himself a committee of one in his own community to cut the hazard involved to a minimum. Good work and a cooperative spirit are two very necessary essentials in reducing premium costs.—B.J.B.

NEW MEDICAL CHIEF

Appointment of Dr. H. E. Hilleboe, formerly director of the Divisions of Tuberculosis and of Services for Crippled Children under the old State Board of Control, to the position of chief of the Medical unit in the new State Department of Social Security is of interest to physicians.

The appointment was announced by Walter Finke, Director of the Social Welfare Divison, who announced that Dr. Hilleboe will continue his former duties and also head the county tuberculosis sanatoria program and the work formerly handled by the division of the deaf in the Industrial Commission.

Dr. Hilleboe went to London as one of four delegates named by Secretary of State Hull to the Fourth World Conference of Workers for Cripples, July 16 to 22, and while he is in Europe he will attend the meeting of the Scandinavian Tuberculosis Congress at Trondheim, Norway, and will study methods of tuberculosis control in the Scandinavian countries, Germany and France before returning early in September.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Minneapolis Physician Censured by Medical Board in Death of Girl Following Criminal Abortion

Re: Charles M. Kistler, M.D.

Following a hearing held before the Minnesota State Board of Medical Examiners on July 6, 1939, Charles M. Kistler, M.D., 327 Syndicate Building, Minneapolis, was voted a censure and reprimand for his part in the facts and circumstances leading up to the death of a 22-year-old Saint Paul girl in the office of Dr. George F. Lemke on the 10th day of December, 1938. Dr. Lemke had his license to practice medicine revoked by the Medical Board on February 11, 1939, for causing the death of the girl, and is under sentence of 5 to 20 years in prison.

On March 3, 1939, at the time sentence was imposed, Dr. Lemke stated to Judge Bardwell that Dr. Kistler had sent the deceased patient to him and had previously referred "similar cases of pregnant women." Dr. Lemke also stated that he had conferred with Dr. Kistler before he "started to operate" on the deceased girl.

(Continued on page 594)

In Memoriam

William James Mayo

1861-1939

WILLIAM J. MAYO, the older of the two Mayo brothers who founded and directed the Mayo Clinic at Rochester, Minnesota, was born at Le Sueur, Minnesota, July 29, 1861. He was the son of English born William Worrall Mayo and of American born Louise Abigail Totten.

The Civil War had just begun. In 1862 as a result of blunders and misunderstandings, the Sioux Indians went on a rampage and the able bodied men who had not gone to war assembled from the neighboring towns at New Ulm where they were successful in quelling the uprising. The small town of Le Sueur was left, however, without defense, and, with the rumor that the town was being surrounded by the Sioux, desperate measures were needed. It was Mrs. W. W. Mayo, whose husband was away at New Ulm with one of the bands mustered from Le Sueur, who mustered the women of Le Sueur, had them dress as men, shoulder any implement that would flash in the sun like a gun, and march around the town to deceive the Indians.

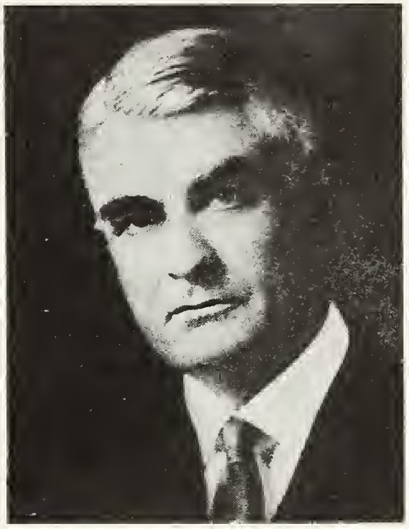
In 1862 the Mayo family moved to Rochester, Monnesota, where Dr. W. W. Mayo became provost surgeon for southern Minnesota in charge of recruiting stations and where he gradually developed a practice which included some surgery.

As a boy it is told how Dr. Will after school hours worked in Geisinger and Newton's drug store in Rochester and learned some chemistry and pharmacy with Henry S. Wellcome, later of the well known firm of Burroughs and Wellcome. In his early teens, Dr. Will accompanied his father on his rounds and helped in the office, being called upon to assist his father at operations.

Finishing high school at the age of sixteen, Dr. Will spent the next three years studying science and the languages, one of these years in a private school, and two in Niles Academy.

In 1880 he began the study of medicine at the University of Michigan, receiving his degree in 1883 at the age of twenty-two. On the faculty there were such outstanding men as Corydon L. Ford, Victor C. Vaughan, Donald Maclean and George Frothingham. Returning to practice in Rochester, he early began the habit of visiting medical centers and in 1884 spent two months in the New York Post-Graduate Medical School, and in 1885 took a course in the New York Polyclinic. When his brother, Dr. Charlie, began practice, the brothers alternated making week-end trips to Chicago to attend surgical clinics. Some trips abroad were added to the program, and it was not long before he became recognized as a master surgeon. Early he began doing the abdominal surgery of the group and he made contributions to operative procedure involving postoperative abdominal hernia, the gallbladder, intestines, kidneys and uterus. His greatest contributions were in the field of gastric surgery, being one of the first to perform radical operations for cancer of the stomach. His interest in operations for peptic ulcer is well known.

Dr. Will gained a well merited reputation as a great surgeon. It is likely, however, that his reputation as an educator and organizer will even surpass his reputation as a surgeon. He founded and developed the first large group practice and the greatest postgraduate medical school in the world. With the establishment of the Mayo Foundation in 1915 in affiliation with the medical school of the University of Minnesota, and the Mayo Properties Association in 1919, a charitable, scientific and educational corporation to hold all the properties, endowments and funds of the Mayo Clinic, the permanency of the institution seems assured.



William J. Mayo, M.D.

From 1907 until his death, Dr. Will served as regent of the University of Minnesota. During the World War as Colonel in the Medical Corps of the Army, he served as Chief Consultant for all Surgical Services of the Army. He and his brother alternated between Washington and Rochester where special training was given medical officers. In 1920 he became Colonel in the reserve and in 1921, Brigadier General.

Following the World War, in 1919, Dr. Will received the Distinguished Service Medal of the United States Army. Other nations honored him. In 1927, he received from the King of Sweden, the Royal Order of the Commander of the Northern Star, and in 1932 he was awarded the Cross of the Royal Order of Knight Commander of the Crown of Italy. In 1934 at a ceremony in Rochester, he and Dr. Charles were presented with a citation "for distinguished service to our sick and disabled comrades and to humanity in general" by the American Legion.

Recognition by scientific organizations included the gold medal of the National Institute of Social Sciences in 1918, the Henry Jacob Bigelow gold medal of the Boston Surgical Society in 1921, the gold medal awarded ex-presidents of the American Medical Association in 1933, the bronze medal of the Inter-State Postgraduate Medical Association in 1936, the medal of the Association of Military Surgeons in 1938, and a citation for honorable service to the Minnesota State Medical Association in 1939.

Of the score or more of honorary academic degrees only a few can be listed. His alma mater conferred on him the degree of Master of Arts in 1890, and Doctor of Science in 1908. The latter degree was accorded him by Columbia University (1910), the University of Leeds, England (1923), Harvard University (1924), Northwestern University (1929). The following institutions admitted him to the degree of Doctor of Laws: the University of Toronto (1906), the University of Pennsylvania (1912), McGill University (1923), the University of Manchester, England (1929), the University of Aberdeen, Scotland (1933), the University of Minnesota (1935) and Notre Dame University (1936). He was a fellow of the Royal College of Surgeons of England, of the Royal Society of Medicine of England, of the Royal College of Surgeons in Ireland, of the Royal Society of Surgeons of Edinburgh, and of the Royal Australasian College of Surgeons.

Dr. Will was one of the founders of the medical undergraduate fraternity, Nu Sigma Nu. He was president of the Minnesota State Medical Association in 1893, the American Medical Association in 1905, the American Surgical Association in 1913, of the American College of Surgeons in 1918-20, and of the Inter-State Postgraduate Medical Association in 1932.

In 1884 Dr. Will married Hattie Damon of Rochester. One daughter, Carrie, married Dr. Donald C. Balfour, and the other, Phœbe, Dr. Waltman Walters.

Dr. Will believed in an afternoon siesta, and maintained the habit for years, a practice which doubtless contributed to the prolongation of an active life for seventy-eight years. His main recreation was his river boat, where he gathered his friends or spent many a restful hour.

In the late winter of 1939, Dr. Will on return from a visit in the southwest, underwent an extensive operation on the stomach. He rallied from the operation sufficiently to visit his office in the Clinic, and to take short automobile trips, but gradually declined until death came July 28, 1939. Funeral ceremonies were conducted in Foundation House, his former residence, which had been recently donated to the Foundation for scientific use.

Charles Horace Mayo*

1865-1939

FROM the beginning of his practice, Dr. Charlie was a member of this Society. He was always interested in it and seldom failed to attend its meetings. In the late nineties, when I first attended these meetings, the Society was like a family group with free discussions and papers by the local members, most of whom have long since departed from this life. Even in those early days, Dr. Charlie and Dr. Will were recognized as masters and teachers. Frequently, visitors from many places took part in the meetings. Dr. Charlie considered the County Society as the proper starting point for medical fraternity and organization.

At that time the Mayo Clinic was already recognized as an important factor in the development of medicine and surgery, and many doctors from all parts of this country and from abroad were coming here.

The formula for becoming great in any line is comparatively simple. One must have a good mind to begin with. Above all he must have absolute devotion to his line of endeavor and the will to work ceaselessly. We often think of hard work as a task, as something that must be done. To Dr. Charlie, work was a joy. His energy seemed boundless. After days spent in hot operating rooms, he was never too tired to attend a medical meeting or to teach. The formula for greatness is something like the reply of the great artist when he was asked by a lady how he made such wonderful pictures. He said it was very simple. It was important to have good material and then simply put the right colors on the canvas in the right places.

To me the most enviable field in which to become great would be to be known as a great physician. Even Christ, saviour and teacher, was honored with the appellation of The Great Physician.

Bismarck in his later days said that he greatly regretted that in order to become great and to form a greater Germany it had been necessary for him to sacrifice the lives of more than eighty thousand soldiers. How different was the life of Dr. Charlie. Besides his great industry and technical skill, his thought always was the saving of life.

A good surgeon requires courage and boldness, but not ruthlessness. He requires also a spirit of caution and conservatism, and must have the cool mind to be able efficiently to cope with the sudden emergencies that may confront him. He must have thorough knowledge of anatomy, physiology and pathology. He must have deftness and manual skill, so that the formula, in medicine, becomes more complicated.

Besides these characteristics, he retained to the end a certain boyishness, as in his love for animals, the circus, and such things, and his interest in country life, flowers and home. Success and honors and praise never changed him from the plain human personality he had always been, and it was his good fortune to be recognized and honored during his lifetime.

He had the ability to instill trust and confidence in all classes and his wit and keen sense of humor must have cheered and allayed the fears of numberless patients. He was naturally kind and considerate. In the winter of 1898, while living elsewhere, I spent a short time at the home of my wife's parents, in Rochester, while convalescing from a long siege of typhoid fever and pneumonia. Every morning, Dr. Charlie used to send his team and driver to take me to St. Mary's to watch operations. At the conclusion of each operation he would take me into an adjoining room to rest on a couch and he would cover me with a blanket, saying he would call me for the next operation, which he invariably did.

His knowledge of medicine and surgery was not limited to any one field. In those early days when there were no specialists here, he pioneered in many fields and his work was not limited to surgery. Then, there was the field of organization and business and building up. The extent of this building up of this great Clinic by Dr. Charlie and his brother is an amazing accomplishment to have been encompassed in the short period of less than fifty years.

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*Tribute read before the Olmsted-Houston-Fillmore-Dodge County Medical Society.

His character and devotion and industry is a glorious beacon to be followed by all who hope to achieve success. May we show our recognition and appreciation of a truly great plain man by rising and standing for a moment.

T. E. Crewe, M.D.

Elmer C. Hanson
1896-1939

Dr. Elmer C. Hanson, Fergus Falls, died suddenly from a heart attack in his office June 23, 1939. He was forty-three years old.

Dr. Hanson was born at Battle Lake December 14, 1896. He was graduated from the Fergus Falls high school, the Park Region Luther College and from the College of Medicine of the University of Minnesota in 1922. He served his interneship in Ancker Hospital, Saint Paul, and the Swedish Hospital in Minneapolis.

In 1922, Dr. Hanson was united in marriage to Clara O. Hatch of Battle Lake, and entered practice at Park Rapids in partnership with Dr. C. A. Houston. He practiced there for sixteen years. He located at Austin last September.

Dr. Hanson was a member of the Exchange and Kiwanis Clubs of Austin and the Masonic Lodge of Park Rapids. He was also a member of the Mower County Medical Society, the Minnesota State and American Medical Associations. He was a member of the Methodist church.

Dr. Hanson is survived by his wife and daughter, Elizabeth, five sisters and one brother.

Charles Arthur Lapierre
1870-1939

Dr. Charles A. Lapierre, Minneapolis, died June 29, 1939, at the age of sixty-eight. He had practiced in Minneapolis forty-eight years.

He was a member of the Hennepin County Medical Society, the Minnesota State and American Medical Associations. He was also a member of the Knights of Columbus, the Catholic Order of Foresters and the St. Anthony Commercial Club.

Dr. Lapierre is survived by his wife, three sons, Dr. Arthur Lapierre, Dr. Jean Lapierre and Dr. Maurice Lapierre; three daughters, Mrs. Matt Barry, Mrs. Joseph Kennedy of Minneapolis, and Mrs. E. W. Beauchamp of Springfield, Massachusetts.

Eugene Silas Strout
1862-1939

Dr. Eugene S. Stout, a well known eye, ear, nose and throat specialist of Minneapolis, died suddenly of coronary occlusion in his office, June 25, 1939, at the age of seventy-six. He had practiced in Minneapolis for forty-five years, having been engaged for a number of years in general practice with offices at Nicollet Avenue and Lake Street before studying in Vienna and London preparatory to specializing.

Dr. Strout was born in Raymond, Wisconsin, and received his medical degree from the University of Michigan.

He was a member of the Hennepin County Medical Society, the Minnesota State and American Medical Associations. He was also a member of the American Academy of Ophthalmology and Otolaryngology, the American College of Surgeons, the Minnesota Academy of Ophthalmology and Otolaryngology, and for many years was on the editorial staff of the Eye, Ear, Nose and Throat Monthly Magazine.

Dr. Strout was a member of the Calvary Baptist Church, the Sons of the American Revolution, and the Ark Lodge of A. F. of A. M.

He is survived by his widow, two sons, Eugene S., Jr., of Houston, Texas, and J. Edward Strout of Excelsior, Minnesota, one daughter, Mrs. Marguerite Angelos of Los Angeles, California, and six grandchildren.

To know Dr. Strout was to have the highest regard for his professional ability and great respect for his integrity and loyalty as a friend and citizen.

Archer Clinton Jacobs
1852-1939

Dr. A. C. Jacobs of Elmore, Minnesota, died at his home June 28, 1939, at the age of eighty-six.

Dr. Jacobs was born near Oswego, New York, August 24, 1852. He was brought to Minnesota shortly after his birth. The family settled near Vernon Center and lived there until 1886. Dr. Jacobs was educated in the elementary grades there and attended high school at Mankato. After graduating from high school he taught school in the neighborhood of his childhood for several years.

In 1884, Dr. Jacobs began the study of medicine in the Minnesota Hospital College, which was later absorbed by the University of Minnesota Medical School. He received his M.D. degree in 1886 and began practice at Elmore, Minnesota, where he remained until his death.

In 1885, Dr. Jacobs married Frances Kinney of Vernon Center. He is survived by his widow.

Dr. Jacobs was a member of the Blue Earth Valley Medical Society, The Minnesota State and American Medical Associations. He served as physician for the Northwestern Railroad at Elmore. His social life centered around the Methodist Church at Elmore, in the administration affairs of which he took an active part. He served as Sunday School teacher for over fifty years. He also took an active part in the town's civic affairs even up to the time of his death. He was widely known throughout the southern part of the state and in northern Iowa as an efficient physician.

MEDICAL BROADCAST FOR AUGUST

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 11:00 o'clock every Saturday morning over Station WCCO, Minneapolis (810 kilocycles or 370.2 meters) and Station WLB, University of Minnesota (760 kilocycles or 395 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota. The program for the month will be as follows:

August 5—Mental Disease
August 12—Diphtheria
August 19—Smallpox
August 26—Getting the Children Ready for School

NORTHERN MINNESOTA MEDICAL ASSOCIATION

The annual meeting of the Northern Minnesota Medical Association will be held at Detroit Lakes, Minnesota, September 8 and 9, 1939. A practical and varied program has been arranged by Dr. C. O. Estrem of Fergus Falls, as follows:

Friday, September 8, 1939

Morning Session

"The Use of Metal in Fractures—Dr. Joel C. Swanson, Fargo
"Painful Conditions about the Head and Face"—Dr. Gordon R. Kamman, St. Paul
"Paralytic Ileus"—Dr. E. A. Heiberg, Fergus Falls
"Pediatric Problems"—Dr. R. E. Nutting, Duluth
"Some Observations on Boehler's Treatment of Fractures"—Dr. B. S. Adams, Hibbing
"Nasal Obstruction: Is It Allergic?"—Dr. C. L. Oppegaard, Crookston
"Vertigo"—Dr. W. T. Wenner, St. Cloud
"Tumors of the Myocardium and Its Coverings"—Dr. W. S. Neff, Virginia

LUNCHEON

Afternoon Session

"Infectious Diseases of the Thyroid"—Dr. T. O. Young, Duluth
"Early Gastro-Intestinal Diagnosis"—Dr. George Earl, St. Paul
"Roentgen Diagnosis in Acute Abdominal Conditions"—Dr. Leo G. Rigler, Minneapolis
The A.M.A. Meeting—Dr. E. A. Meyerding

Evening Session

BANQUET—6:30 P. M.

Toastmaster—Dr. F. J. Hirschboeck
Address: "The Trend of the Times"—Senator A. O. Sletvold, Detroit Lakes

Saturday, September 9, 1939

8:30 A. M.—Clinical Pathological Conference—By a group of prominent medical men from Duluth and Rochester, headed by Dr. E. L. Tuohy, Duluth.

Attending physicians as well as their ladies will find recreation and entertainment provided.

The officers of the Association are: Dr. O. F. Melby, Thief River Falls, president; Dr. C. W. Simison, Hawley, vice president; Dr. Clarence Jacobson, Chisholm, secretary-treasurer.

INSTITUTE FOR THE CONSIDERATION OF THE BLOOD AND BLOOD FORMING ORGANS

An Institute for the Consideration of the Blood and Blood Forming Organs will be conducted by the University of Wisconsin Medical School at Madison, September 4 to 6 inclusive. The program will consist of morning and afternoon lectures by well known authorities on the blood from this country and abroad. Names on the program include: Dr. L. J. Witts, Oxford, England; Dr. E. Meulengracht, Bispebjaerg Hospital, Copenhagen; Dr. C. P. Rhoads, Rockefeller Institute for Medical Research, New York; Dr. George R. Minot, Harvard Medical School, Boston; Prof. Hal Downey and Dr. Cecil J. Watson, University of Minnesota Medical School; Dr. Paul Reznikoff, Cornell University Medical School, New York City; Dr. Charles A. Doan, Ohio State University, Columbus; Dr. Edwin E. Osgood, University of Oregon Medical School, Portland; Prof. C. A. Elvehjem, College of Agriculture, University of Wisconsin; Dr. Louis K. Diamond, Harvard Medical School; Dr. E. B. Krumbhaar, University of Pennsylvania Medical School, and others.

A banquet is scheduled for the evening of September 5, and a meeting open to the public and to be addressed by Dr. George R. Minot will be held the evening of September 4.

Inquiry should be made to the Institute Committee, 465 Wisconsin General Hospital, Madison, Wisconsin.

MEDICAL RESERVE TRAINING COURSE

The eleventh annual Inactive Status Training Course for Medical Department Reservists of the Army and Navy will be held at the Mayo Foundation, Rochester, Minnesota, October 8 to 22, 1939.

During the past ten years this school, the first of its kind, has been remarkably successful. Officers attending have been most enthusiastic. The general plan of former years will be followed. Special work in clinics and hospitals will be offered during the morning hours for those asking special assignments. Presentations of carefully selected subjects in military medicine are scheduled for the morning, afternoon, and evening hours. There will be appropriate sections or special courses for officers of the Dental and Veterinary Corps.

All Medical Department Reservists are eligible for enrollment. Approved applicants will be enrolled upon the recommendation of the Surgeon of the Seventh Corps Area or the Surgeon of the Ninth Naval District. Applications should be made at an early date and should be forwarded through the respective Reserve headquarters of the officers concerned.

Communications should be addressed to Colonel Kent Nelson, Headquarters Seventh Corps Area, Omaha, Nebraska.

Meeting of May 10, 1939

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, May 10, 1939. Dinner was served at 7 o'clock and the meeting was called to order at 8:10 p. m. by the President, Dr. Carl B. Drake.

There were 35 members present.

Minutes of the April meeting were read and approved.

Dr. Drake read a letter from Dr. William Davis, St. Paul, a charter member and past president of the Academy, asking that his name be transferred to the Senior Membership list. This transfer had been approved by the Executive Committee. It was voted on and accepted by the Academy.

The scientific meeting consisted of the following case reports.

PREMATURE SEPARATION OF THE PLACENTA

R. T. La Vake, M.D.
Minneapolis

This case is interesting because of its rarity, but especially interesting because it involves so many important problems associated with the diagnosis and treatment of severe cases of premature separation of the placenta.

The first three pregnancies, parturitions and puerperia of Mrs. X were absolutely normal.

The fourth pregnancy was normal in every detail until term, when she suddenly awoke in the night with a terrific abdominal pain and with profuse vaginal bleeding. She was brought to the hospital in severe shock. Intravenous 10 per cent glucose was started and donors sought for cross-matching. Examination showed a board-like tender uterus, and the whole abdomen was slightly tender. Since her pain started no fetal movements had been felt, and fetal heart sounds could not be obtained. By rectum, the head was found to be presenting behind a thick cervix with no sign of beginning dilatation. The head could be palpated around the entire cervix and there was no evidence of low placental implant. Immediate consultation was held and it was decided that the safest course was to perform a cesarean section as soon as she could be transfused. Cesarean section was chosen for the following reasons:

1. From the severity of the initial symptoms, and the findings of uterine palpation, a Couvelaire uterus was suspected which would not contract after emptying. If this were found, we could take the uterus out immediately.

2. She was bleeding so profusely from below that it did not seem likely that we could replace blood in sufficient quantity to forestall death if we treated the case expectantly. Accouchement forcé is accompanied by the highest maternal mortality rate.

3. No contraindication to cesarean section existed. Membranes were unruptured; she had not been long in labor, if in labor at all; no vaginal examinations had been made and she had carried out our routine instructions to all expectant mothers, namely, that nothing must be allowed to enter the birth canal during the last three months of pregnancy, shower baths being substituted for tub baths.

She was transfused and a quick cesarean performed.

There was a large amount of free blood in the peritoneal cavity. The uterus and broad ligaments were discolored in large splotches by subperitoneal hemorrhages. The placenta was completely detached. The baby was dead.

After emptying the uterus, it contracted under pituitin and manipulation and stayed contracted.

The patient made an afebrile recovery.

Two years later she asked if it would be safe for her to become pregnant again. She was given an affirmative answer after a careful general checkup. She promptly became pregnant and progressed normally in every way. At the thirty-fourth week, though everything was apparently normal, a consultant was chosen who went over the history and made a very careful physical examination but could find nothing abnormal at the time. We decided to make preparations for any contingency but we felt that she should be given a chance to go through normal labor. She had delivered three children with ease and the afebrile nature of her recovery from the cesarean section pointed to the likelihood that uterine healing had been good.

One week later to the day, in the thirty-fifth week of pregnancy, she had an exact repetition of her former disaster. Cesarean section was again chosen. Though we knew that the uterus had contracted well before, in the face of a severe uterine and abdominal disturbance we thought we might have been incorrect about the strength of the uterine scar. Her blood pressure was raised to normal with parenteral fluids and a blood transfusion, and a cesarean performed. The findings were the same as at the first operation except there was no blood in the peritoneal cavity. The scar of the first section could not be demonstrated. The uterus contracted promptly after emptying. Her convalescence was uneventful except for twenty-four hours on the fourth day when a partial obstruction was feared. Following operation she had to be transfused twice within six hours for falling blood pressure.

She left the hospital in excellent condition on the twenty-first day. One month later she presented for her final postpartum examination and was found to be normal in every way.

From a survey of literature and my own observation and experience, such severe cases involving a debatable choice between cesarean section and expectant treatment occur approximately once in ten to twenty cases of premature separation of the placenta of clinical severity. These are the cases that likely swell the mortality rates no matter what form of treatment is chosen. However, to my mind, under conditions and findings outlined above, cesarean section is safer for the mother than expectant treatment. I believe that such a choice fulfils Dr. Litzenberg's dictum that conservatism is knowing when to be radical. If a noncontractible uterus due to placental apoplexy is a true entity at times, I do not see how we can safely avoid delivery by the abdominal route when suspicious of its existence. However, it is a fair question whether, in the cases reported, the failure to contract was not due to severe anemia, shock and the general inhalation anesthetic used. The overcoming of shock and anemia by parenteral fluids and repeated blood transfusions and the use of local anesthesia, where feasible, may eliminate the entity of a noncontracting uterus and thus make cesarean inadvisable except in the very few cases of severe separation where the age of the fetus and the strength of the fetal heart sounds give reasonable promise that the child may be saved by cesarean and no contraindications to cesarean obtain.

Statistics suggest that expectant treatment is three times more safe for the mother than cesarean section —a maternal mortality of approximately 4 per cent to 12 per cent, respectively. However, if one considers the fact that in most instances only the most serious cases have been chosen for cesarean section, the comparison is misleading; especially when it is manifest that a large share of cesarean mortality in this condition has been due to neglect of contraindications, or due to operating before the patient has recovered from shock under treatment of parenteral fluids and blood transfusion and due to failure to follow operation with as many transfusions as the blood pressure and anemia demand.

Expectant treatment consists of hospital supervision, the constant combating of fall of blood pressure and loss of blood by parenteral fluids and blood transfusion as indicated; but, if it is reasonably possible, allowing labor to progress normally. By and large, it is likely that more women die from sepsis following ill-advised and poor aseptic intervention than from hemorrhage. If labor must be induced or expedited, simple rupture of the membranes is the method of choice if the head or breech is engaged. The use of an abdominal binder in the attempt to limit ballooning of the uterus is rational. Though the use of bags to initiate or expedite labor is more dangerous than simple rupture of the membranes in point of likelihood of infection, if the head or breech is not engaged, I prefer bags to rupture of the membranes. Under such conditions, bags give one more control over labor and external bleeding, and, when dilatation is complete, we are in a position to effect emptying of the uterus more safely than when no waters remain and we are confronted with other than a head or breech presentation. After one sees a few of these uteri, one can appreciate why version is to be avoided if possible.

I realize that many men do not place great store on the bactericidal properties of the normal vaginal flora and chemistry. However, Dr. J. Whitridge Williams in his early investigations convinced me of their importance and my clinical experience has tended to substantiate his views. Barring obvious vaginal and cervical infection, I feel quite safe if nothing has entered the vagina in the few weeks preceding delivery. To my mind, failure to carefully instruct women that nothing must enter the birth canal in the last three months of pregnancy accounts for much of our sepsis in every type of delivery. I used to confine this interdiction to the last six weeks, but several experiences with placenta previa and premature separation at the beginning of the seventh month made me extend the interdiction to the last three months. During this period sponge or shower baths should be substituted for tub baths. Tub baths are not so dangerous for primiparæ but for multiparæ with patulous introitus I feel reasonably confident from definite experience that ingress of infected bath water is a likely source of infection.

By the same token, physicians should make their diagnoses by abdominal and rectal examinations. The most convincing proof of the danger of vaginal examinations is to be found in the study of cesarean statistics. Not only should we follow this practice in labor, but in the weeks preceding labor. Though this practice is important in every case, it becomes more important if any type of intervention becomes imperative, and especially important if cesarean section is under consideration. Let any man review his observations of sepsis following the most meticulous hospital aseptic vaginal technic, or, better, following no intervention at all, and I believe he will sense the likely part played by lack of aseptic foresight on the part of patient or physician in the days immediately preceding labor.

The major considerations, upon the slightest suspicion of premature separation, are: constant supervision and the lining-up of compatible donors, and immediate access to parenteral fluids. Blood transfusion is fraught with danger if one does not observe the following precautions: Always cross-match recipient and donor immediately before transfusion. In the above case a donor lined up, because compatible two years previously, was found to be incompatible when needed. Utilize the possibilities of one donor before turning to another. And do not use this second compatible donor until you have recross-matched him or her with the recipient. Transfusion with the first donor may have rendered the blood of the second donor incompatible. The interpolation of parenteral fluids, when necessary, will permit time for the proper cross-matching of successive donors.

Discussion

Dr. E. M. Hammes (St. Paul): Did you remove the uterus after the second experience with this woman?

Dr. La Vake: No. The uterus contracted promptly and stayed contracted. She requested, before the operation, that we would not section the tubes and not remove the uterus unless necessity demanded.

Dr. C. B. Drake (St. Paul): Did you plan to let her have a normal delivery?

Dr. La Vake: Yes, unless definite signs and symptoms directed intervention. We realize now that if we had performed a cesarean section at the thirty-fourth week when everything appeared normal we would likely have obtained a viable child and certainly would have prevented the dangerous accident that occurred. However, if we had operated and found no pathology and then lost the child because of prematurity and possibly met with some accident with her, without the backing of the slightest indication for intervention, we would have felt deeply culpable. About 80 per cent of these cases are associated with signs of toxemia, any aggravation of which are helpful in guiding a decision. In this case no signs of toxemia existed at any time.

Dr. O. H. Wangensteen (U. of M.): Dr. La Vake's remarks concerning the hazards of vaginal examination prompt me to comment upon another potential avenue for serious infection in the parturient woman. The demonstration of the presence of bacteria in the vaginal secretions is in the main well known. How the introduction of a sterile gloved hand into the vagina can be so hazardous has always been somewhat of an enigma to me, granted, of course, that the vaginal manipulation is done gently and only after careful preparation of the vulva. I have the impression that this matter has been stressed more than it deserves and that adequate *masking* of all participants in the delivery has not been stressed enough.

A number of years ago it was shown in Professor v. Mikulicz's surgical clinic in Breslau that the wearing of a mask which covered both nose and mouth was a most important principle in thwarting wound infections. When the B. Prodigiosus was placed in the mouth of the speaker and he wore no mask, growth upon the plates placed a few feet in front of him was usual after incubation. When the speaker wore a mask covering both nose and mouth, growth upon the exposed plates in front and behind the speaker were quite similar. A mask covering the mouth was far more effectual than no mask, but only one covering both nose and mouth provided satisfactory protection.

In the adjudication of comparative merit, I would assign as much credit to the innovation of masks into surgical activity as the rubber glove. We all need to give more credence to this source of potential infection. The nurse attendant who shaves the parturient woman should wear a mask which covers both nose and mouth. If she does not and engages the patient in conversation while shaving the vulva she might project streptococci readily into the vagina. This source as the initial focus of a streptococcal puerperal sepsis should, I feel, be given more serious consideration by obstetricians as well as by general practitioners.

Serious wound infections which threaten life are frequently due to the hemolytic streptococcus. Numerous reports of surgical wound infections traceable to a hemolytic streptococcus harbored in the nose and throat of a participant in the operation are to be found in medical literature. In our own operating rooms at the University Hospital, the patient wears a mask over nose and mouth throughout the operation if it is done under regional anesthesia; otherwise the mask is removed only when the anesthetic is started. The patient may infect her own wound! The entrance to each operating room carries this admonition:

> "Anyone entering the Operating Room for any purpose whatsoever must wear a mask which covers both the nose and mouth."

I do not mean to discredit the matter of conservatism in the avoidance of vaginal examinations when the desired information can be gotten by other means. I do wish to direct attention, however, to an important matter which has not received the consideration it merits, namely, the opportunity for droplet infection in the vagina of the parturient woman by inadequately or improperly masked persons in attendance.

Dr. T. S. Roberts (Minneapolis): In twenty-five years of a fairly active family practice I was fortunate in encountering only one case of complete premature separation of the placenta. The woman had had three previous pregnancies which were perfectly normal. She was nearing the end of this, her fourth, pregnancy without evidence of toxemia or anything abnormal. One day as she was playing the piano she felt that something serious had happened, and went immediately to bed. I arrived very soon after. She was in great pain and the abdomen was distended and board-like, and there were marked symptoms of hemorrhage. The cervix was closed but not very hard. There was no one in the house to assist, but something had to be done right away. I put my hand into the vagina, opened up the cervix, pressed hard on the fundus and the uterus contracted firmly. The dead baby, placenta and seemingly about one-third of the patient's blood all came together with such force that blood went clear over the foot of the bed. The woman was pretty well exsanguinated, of course, but transfusions were not thought of at that time. She made a good recovery and had another normal pregnancy within a couple of years.

Dr. H. A. H. Bouman (Minneapolis): I would like to ask Dr. La Vake if he is familiar with the work of Dr. Guggisberg, Professor of Obstetrics, of Bern, relating to the great need of vitamins during the pregnant state. The invading infection should not move the resident resistance entirely from our consideration. Some of the toxic states are connected with avitaminoses or deficiencies, and they may be primary or secondary. The case related reminds one of purpura and there vitamin C is of importance. The epithelial integrity depends upon vitamin A, which cannot be formed in the liver, if the condition of the intestine prevents the absorption of soluble fats. A discussion of the anemias and their relation to the B group, and of osteomalacia, osteoporosis and tetany to others, would lead too far afield.

Dr. La Vake (in closing): The well-rounded diet, theoretically rich in every vitamin, would lead me to doubt the likelihood of avitaminosis being the cause, at least in this instance. However, avitaminosis is a suggestion that should not be ignored. The appearance of the uterus and broad ligaments is as distinctive and bizarre as the gingivitis of scurvy, and other manifestations of avitaminosis. The conditions associated with premature separation that have suggested a causal influence have been toxemia of pregnancy, trauma or exertion, short cord, chronic nephritis, fibroids, and various types of general infections acute or chronic. Careful inspection of every placenta makes it obvious that subclinical and unsuspected accidental hemorrhage is not very uncommon. It has been felt that ablatio placentæ is likely a massive manifestation of accidental hemorrhage. To many, the hemorrhagic manifestations far removed from the placental site in uterus and broad ligaments are attributable to the toxemia and hypertensive phenomena that cause retinal changes. To my mind, the causative toxins come from the fetus and placenta because the manifestations subside on removal of the products of conception.

Dr. Wangensteen's observations are very important. Since Dr. Benjamin P. Watson's researches at the Sloan Hospital for Women in reference to droplet infection from attendants upon parturient women, we have masked all attendants. We have not masked the patient, but we do impress upon her the danger of touching the vulva or contaminating the vulvar dressings.

SPONTANEOUS DETACHMENT OF THE CHOROID WITH RECOVERY

Hendrie W. Grant, M.D.
Saint Paul

Mr. A. M. L., aged 69, was first seen October 4, 1937, complaining of blurred vision of the right eye. Six weeks previously he had had a foreign body in the right eye while threshing and this member had been sore for one week. He was not certain that vision was good before the accident occurred.

Vision:
Right 10/200 —100S +325 × 45 = 20/50
Left 20/40 — 25S +100 × 135 = 20/20
+ 250S = No M.
+ 250S = 37 M.

The oculo-motor system was normal. Examination showed cornea and anterior chamber normal. The right lens had a posterior cortical lens opacity, not dense, and mostly in the lower half of the lens. The rest of the lens was clear but the lower portion of the fundus was poorly visualized because of the lens opacity. The left eye was normal throughout and no vascular changes were present. By March 28, 1938, the cataract on the right eye was practically mature with vision—moving objects; good perception and projection present. Cataract operation was proposed and accepted. At this time the general physical examination was essentially negative. The leukocytes numbered 6,350. Blood pressure was 140/80, and the urine specimen was normal. Operation on March 29 was a combined extraction with conjunctival flap, irrigation of the anterior chamber and conjunctival sutures. A small amount of cortex remained in the anterior chamber. At the first dressing a small iris prolapse was noted at the lower temporal margin of the incision and a slight ciliary congestion. There was no evidence of sepsis. There was considerable difficulty with bedside examination and because of the ciliary congestion 20 million typhoid antigen H. was given intravenously on April 8, 30 million on April 10 and ½ million of triple typhoid State Board vaccine on April 12. On April 15, the prolapsed iris was excised under a conjunctival flap and the conjunctiva sutured with silk sutures. Convalescence was uneventful with only a moderate ciliary congestion and he was discharged from the hospital April 21. His progress was quite satisfactory and treatment consisted of atropin locally and one injection of typhoid antigen H. 40 million on April 22. On April 26, the eye was quiet and he left for his home in the northern part of the state.

On May 12, he returned with the history that he had been in the field working and that the left eye had been painful for the past two days. He had used the medicine prescribed for the right eye (scopolamin, cocaine, adrenalin mixture), which had relieved the pain. Examination of the right eye revealed a moderately severe ciliary congestion, an apparent shrinking of the cornea, a shallow anterior chamber with the iris drawn upward, no deposits on the posterior corneal surface and a soft eyeball. The left eye showed a slight ciliary blush, cloudy cornea with many precipitates on the posterior surface, a cloudy shallow anterior chamber; many deposits on the anterior lens surface and a few small posterior synechia below. The tension was decidedly minus. Because of the cloudy cornea and anterior chamber and the deposits on the lens surface, the retro-lental space could not be visualized with the microscope. Diagnosis of probable sympathetic ophthalmia was made. The patient returned to the hospital and was given sodium salicylate grs. 125 per rectum. On May 13, ½ million triple typhoid vaccine was given intravenously and on May 14, 175 grs. of sodium salicylate by rectum. On May 15, examination of the left eye disclosed no ciliary congestion, anterior chamber was of normal depth with some deposits on the posterior corneal surface, lens clear, vitreous hazy, optic nerve margins indistinct and optic nerve slightly elevated. In the upper nasal quadrant there was a dark mass which extended into the vitreous and had the characteristics of a choroidal detachment or malignant melanoma. General physical examination, Wassermann, Mantoux and sedimentation rate were normal. Blood pressure was 140/80. There was no evidence of tumor metastasis. By May 17 the dark mass had involved the whole upper half of the fundus and transilluminated poorly. All treatment, with the exception of scopolamine and atropine locally, was discontiued at this time. By May 21, the detachment had decreased considerably and was visible on the nasal side only. Slight variations in the amount of detachment had been visible from day to day but by May 23 the detachment had completely disappeared although the fundus was still hazy and the optic nerve margins elevated. On May 26, typhoid antigen 40 million was given intravenously and the following day sulfanilamide treatment was begun and continued until June 5. There seemed more improvement following the sulfanilamide therapy than either the use of salicylates or non-specific protein therapy. Local treatment was continued until June 28, at which time the patient was discharged from the hospital.

On June 15, the vision was 20/65 in the left eye and the visual field showed a moderate contraction. There was no evidence of any choroidal detachment although there were still many deposits on the posterior corneal surface and the anterior lens capsule. These deposits seemed to be made up entirely of pigment. On July 12, the patient again returned to the hospital and was given 100 grs. of sodium salicylate in a starch retention enema on the 13th and 14th of July. He was discharged on the 16th and the vision at this time was 20/40+ in the left eye. The vision was next observed on September 8th after he had discontinued the use of mydriatics in the left eye for three weeks. His vision had improved enough for him to read a newspaper without much trouble. Examination showed the eye quiet, with only a few deposits on the corneal surface, and the lens clear. The vitreous showed a number of opacities and the nerve was slightly hazy. The vision was 20/30. On November 28 the examination showed the left eye clear except for a very few pigment spots on the corneal surface and a vision of 20/20-2 with correction. The final examination was made on March 20, 1939, and showed vision to be 20/20-2. The right cornea was 7 × 9 mm. with a shrunken globe and a fair tension. The left cornea was clear, the anterior chamber was slightly shallow, and there were no precipitates on the corneal surface. The iris showed a thin, veil-like exudate with some proliferation of pigment on the anterior surface. The lens was clear, while the vitreous had one or two small opacities. The optic nerve margin was still slightly hazy. The visual field was normal.

Detachment of the choroid, first noted in 1854, is now known to occur very commonly following intraocular operations. The subject of detachment following surgery has been completely reviewed by Verhoeff and Waite, O'Brien, Hudson and Verhoeff and Wurdemann. The latest contribution by O'Brien describes the immediate occurrence after cataract surgery with the addition of his experimental studies. Spontaneous detachment of the choroid is a much less common occurrence and is usually seen after enucleation. Its clinical observation would seem to be difficult because of inability to observe the fundus and may be much more common than is generally recognized. Hudson's report of many pathological specimens would indicate that it is frequently seen after enucleation and not previously diagnosed before operation. In the case here reported, detachment occurred in conjunction with a severe uveitis and completely subsided with the return of normal vision. Whether the detachment was dependent upon the uveitis present or due to the use of salicylates and non-specific protein therapy, is entirely a matter of conjecture. In this instance the shallow anterior chamber and low tension were noted and were probably explained by the severe uveitis.

The possibility of a sympathetic uveitis must be borne in mind, although it seems decidedly unusual for a complete return of vision without adhesions of the iris in this type of inflammation. Purtscher described a similar condition associated with serous tenonitis which also was associated with retinal detachment. In one of Verhoeff's cases, a retinal as well as a choroidal detachment was present.

Procksch in 1933 reported a case of spontaneous detachment following the use of glaucosan in a case of iritis which had been present for four weeks. In this instance a very marked hypotony with a very deep anterior chamber followed the use of glaucosan and he was of the opinion that the detachment occurred as a result of the reduced tension. Shortly after the choroidal detachment a retinal detachment also occurred with complete loss of vision.

This case is perhaps unusual because of the complete return of vision with only moderate effects of the severe uveitis present.

ACUTE LUPUS ERYTHEMATOSUS

Report of a Case

H. E. Michelson, M.D.
Minneapolis

Mrs. M. B., a white woman, aged 31, suffered a severe sunburn in July, 1936. She was treated with local applications by her family physician but did not improve. She then went to a local clinic where injections of a vaccine were given and the lesions healed. There remained, however, a slight redness and swelling of both cheeks extending across the bridge of the nose.

The patient was in good health until July, 1938, when she suffered a recurrence without being directly exposed to the sun. She returned to the clinic in August, where a specimen for biopsy was taken and the patient tested for sensitivity to ultraviolet rays. She was discharged to the care of her family physician.

On her return home, the area which had been exposed to ultraviolet rays became severely inflamed. This inflammation spread to the rest of the body, but was most pronounced on the exposed surfaces. Her condition became worse and she was admitted to a local hospital in September, where she received injections of splenic extract. She improved and was discharged in November.

She was in good health until the early part of January, 1939, when she suffered a severe exacerbation. She had severe headaches and was re-admitted to her local hospital, where she became unconscious. Her temperature ranged from 100° to 104° F. There was no albuminuria. She was again given injections of splenic extract, and boric acid ointment was applied to the lesions. She improved slightly and on February 6 she was admitted to the University Hospitals.

Physical Examination: The patient was well nourished but appeared acutely ill. The blood pressure was 115 systolic, 50 diastolic. The face was edematous and erythematous. There were numerous oozing and crusted lesions, especially over the cheeks and on the chin. The eyes were edematous. There was no evidence of retinitis by ophthalmoscopic examination. The right tympanic membrane showed a healed perforation. The left was ruptured and there was a thin watery discharge from this ear. The nasal cavity was filled with yellowish crusts. The lips were edematous and fissured. The tongue could not be protruded because of the swelling of the organ and the inability to open the mouth widely. There were many denuded areas of the mucous membranes.

Examination of the chest disclosed normal findings. The heart was not enlarged and there were no abnormal sounds. The liver and spleen were not palpable.

The exposed areas of the skin were erythematous and edematous. There were denuded areas on the face, neck, chest and back, the surfaces of which were covered with a dry yellow crust. On the back these lesions were present within a V-shaped area corresponding to the outlines of a bathing suit, in the center of which was a sharply marginated erythematous edematous patch at the point of exposure to ultraviolet rays.

Over the remainder of the trunk and extremities were scattered papular, erythematous lesions. In some areas these coalesced to form irregular plaques, especially on the upper arms and thighs. On the fingers were large superficial pustules.

Roentgen examination of the chest showed no evidence of recent or active tuberculosis. There was thickening of the interlobar pleura, probably from an old pulmonary infection. Roentgen examination of the mastoid area showed marked sclerosis with absence of cells.

Microscopic examination of a portion of the skin excised from the right thigh showed findings consistent with the diagnosis of acute disseminated lupus erythematosus. There was edema with separation of the epithelium from the cutis and vesicle formation. Hyperkeratosis and vacuolation of the epithelial cells were present. There was a diffuse lymphocytic infiltrate scattered throughout the corium.

Albuminuria was found in daily examinations. There was moderate anemia. The leukocyte count was 4,950 on two occasions and the differential was normal. The blood Wassermann test was negative. The blood urea nitrogen and blood sugar were normal. The blood sedimentation rate was 118 mm. in 60 minutes. Porphyrin studies of the urine six days after the beginning of therapy with sulfanilamide were normal.

Cultures of the lesions on the chin, upper lip and hands all showed the presence of the beta hemolytic streptococcus. A culture of the blood taken on February 10 was negative. Culture of the urine on February 21 showed the gamman streptococcus.

Sulfanilamide was given orally at the rate of 60 grains per day, beginning on February 11. Blood sulfanilamide levels were as follows:

February 14— 6.6 mg. per 100 cubic centimeters.
February 16— 8.7 mg. per 100 cubic centimeters.
February 21—13.2 mg. per 100 cubic centimeters.
February 23—21.5 mg. per 100 cubic centimeters.
February 24—15.9 mg. per 100 cubic centimeters.
February 25— 8.4 mg. per 100 cubic centimeters.

The patient was able to take sulfanilamide orally until 12 M. on February 24.

The temperature range was from 98° to 104° F. The leukocyte count on February 9 and 12 was 4,950. On February 16 it rose to 6,950, and on February 22 it was 9,700. The patient did not improve, but nevertheless remained in good condition until February 22, at which time she had received the drug for twelve days. She then became gradually weaker and died at 4:30 a. m. on February 26.

Necropsy: Postmortem examination rvealed the following:

1. Bilateral bronchopneumonia
2. Pleural adhesions on the right side
3. Abscesses of the left lung
4. Hydropericardium
5. Acute splenitis
6. Cloudy swelling of the myocardium, liver and kidneys
7. Chromaffin cell tumor of the right adrenal gland.

There was no evidence of tuberculosis.

Discussion

Dr. S. E. Sweitzer (Minneapolis): This is a very important question from the standpoint of the general practitioner for they know practically nothing about this disease. From the standpoint of the present mode of sun-bathing, I think it is extremely important. In New York City there is a tremendous crop of this disease every summer, brought on largely by exposure to the sun. One of the early cases we had here was a nurse at Northwestern Hospital who went to Oklahoma. She went to a picnic, I think on the 4th of July, and a few days after that developed a dermatitis. In the fall she came back to Minneapolis and saw Dr. Butler. By Christmas she was dead. There is nothing to do for these patients. I think we have not had any in which we have found any tuberculosis. As far as we are concerned up here, we don't know what causes it and there is practically no treatment. I think it can come from exacerbation of the discoid type. The first case I had was the discoid type of lupus erythematosus. She had some septic teeth and I asked that the teeth be extracted one at a time, but they were all pulled out at one time. She developed what looked like dermatitis venenata and showed swelling, redness and exudation.

Dr. J. M. Armstrong (St. Paul): I think several years ago we had a discussion here on acute generalized lupus erythematosus. I have been unfortunate enough to have had several of these patients and only one recovered. Dr. O'Leary thought this was sub-acute lupus erythematosus but I thought it very acute. This patient had a child but she was unable to nurse it. She became pregnant again one month after the birth of the first child. She had a chronic type of lupus erythematosus. During pregnancy the disease flared up and became generalized. After consultation, the uterus was emptied at the sixth month, and she recovered completely. One thing about these patients that I have never seen mentioned is that they retain consciousness to the end, and there is a marked nervous anxiety, a fear of impending disaster. Another thing, the patients I have had with disseminated lupus erythematosus all died apparently of pulmonary edema.

Dr. Michelson (in closing): We had a patient at the University Hospital, a Filipino boy, who had acute lupus erythematosus, mis-diagnosed. We gave him sulfanilamide in large doses and he began to get better. This boy committed suicide and at postmortem it was found he had an acute miliary tuberculosis.

CONGENITAL SHORTENING OF THE SMALL BOWEL WITH AN ANOMALY OF ROTATION

Martin Nordland, M.D.
Minneapolis

Dr. Nordland reported the following case and showed slides.

As a preliminary to this report, let us review briefly the mechanism of development of the gut to its normal adult structure and position. At about the fifth week of intra-uterine life, the alimentary canal can be divided into the fore-, mid-, and hind-gut, dependent on form and the blood supply from the celiac, superior and inferior mesenteric arteries, respectively. In the adult, all the intestine from the ampulla of Vater to the left third of the transverse colon comes from the mid-gut and it is in this segment that we find the majority of all malformations and anomalies.

The first stage of rotation occurs between the fifth and tenth week of intra-uterine life, while the mid-gut loop lies in the umbilical cord. During this time there is a lengthening of the gut with the formation of an S-shaped flexure. There is no fixation in this stage. The second stage is completed by the tenth or eleventh week of intra-uterine life in which the mid-gut returns from the umbilical cord to the abdominal cavity and in which the cecum goes to the right loin. In this stage there is a 270-degree rotation counterclockwise of the mid-gut around its artery that throws the duodenum behind and the transverse colon in front of its vessels. This forces the descending colon to the left. The third stage is the final fixation of the portions and the fusions of the intestines into the adult positions.

Dott outlines the derangements of rotation as follows: In the first stage there occurs no anomaly except in the rate condition of extroversion of the cloaca. In the second stage, there are three types of anomalies: (1) non-rotation of the mid-gut loop in which the small intestine lies to the right and the colon to the left of the midline; (2) reversed rotation of the mid-gut loop with 90-degree clockwise motion occurring instead of the normal 270-degree counterclockwise, and in this we find that the duodenum and the superior mesenteric artery are anterior to the transverse colon; (3) many other unclassifiable anomalies due to anomalous rotation of the mid-gut loop. In the third stage the derangements that occur are: (1) early flexion of the cecum; (2) failure of elongation of the colon; (3) deficient fixation of the post-arterial mesentery that causes us to find a mobile cecum or a floating ileocolic segment with the cecum and the appendix in the region of the spleen.

In the literature up to 1931 there had been 100 cases of anomalies of rotation reported and there were fewer than five cases, in the whole literature, of shortening of the intestine congenitally. These were all discovered as accidental findings when the abdomen was opened for some other reason. The majority of all these cases were found in children and were fatal in their outcome. Haymond and Dragstedt, in Surgery, Gynecology and Obstetrics for September, 1931, reported two cases in adults that were found accidentally at a surgical procedure for another cause. One of these had an anomaly of rotation of the second stage in a man who came to necropsy at the age of 67 but was operated upon for carcinoma of the stomach one year previous. At this time the small intestine was in a peritoneal pouch in the abdomen and was on the right side, a condition formerly called "intra-abdominal hernia" by those men who had such rare cases. Their other case was that of a sixteen year old boy who was losing weight, vomiting, and who had had epigastric distress since birth. This was diagnosed as obstruction at the duodeno-jejunal junction by x-ray and so an exploratory laparotomy was performed. At this time, an anomaly of the third stage of rotation was found with reversal of rotation in which the duodenum lay anterior to the transverse colon and some bands exerted pressure on the proximal jejunum which gave the partial obstruction. The cecum and appendix were in the left upper quadrant but apparently were asymtomatic. The boy gained weight following the straightening of this anomaly and the anchoring of the cecum in the right lower quadrant, and at present gives every evidence of being in the best of health.

There have been four mentions of the congenital shortening of the small intestine up to 1937 in the literature but the only one described was the case of L. Merola which he reported in the "Anales de la Facultad de Medicina, Montevideo," in October, 1925, when, at operation for abdominal injury from an automobile accident, the small intestine was only 80 cm. in length and dilated throughout with many dilated veins and arteries supplying the gut. The patient was a 60-year-old male who had had no symptoms associated with his intestine at any time.

Case Report

The case reported this evening is that of a twenty-six year old white male, who presented himself with the complaints of generalized weakness, nausea, headaches and palpitation. For the month prior to admission, the patient had severe headaches with a sensation of his heart pounding in his head. These were not related to food, activity, or time of day. On several occasions during the last two or three months he has noticed tarry stools and these have been darker and more frequent the past two weeks prior to admission. One week prior to admission he felt weak and then lost consciousness. His family history, past history, and marital history are non-contributory.

On physical examination he is revealed as a well-developed, well-nourished, very pale white male, aged 26, not in acute pain or distress. The examination was essentially normal except for a regular tachycardia with a full and bounding quality to the heart tones and for some tenderness in the left upper quadrant and tympany to percussion on the right side of the abdomen.

On laboratory examination the urine was normal. He had several tarry stools and the stools tested positive for blood. His hemoglobin was 45 per cent and his red count 2,900,000, the color index being about .8.

The x-ray report of the gastrointestinal series showed a normal distribution of the barium meal at one, two, four, and six hours. The stomach and duodenal cap appeared to be entirely normal. There was a dilatation of the jejunum and the proximal ileum, the cause for which could not be made out on x-ray. The colon was reported as normal except for a non-rotation of the cecum, which lies on the left side and high.

At operation the cecum was found in the embryonic position with the appendix high under the left costal margin. The small intestine was traced throughout its entirety and found to be eleven feet in length. The proximal five feet were dilated with thickened wall and one portion about five inches in length was more dilated than the remainder. The distal six feet were normal in size and in the texture of the wall. The distal ileum was firmly attached to the proximal jejunum high up in the abdomen, and underneath the two loops of small intestine was seen the superior mesenteric artery. This artery was the size of a large finger and there was no inferior mesenteric artery seen. The postoperative course was uneventful and the patient was sent home on the fourteenth postoperative day. He has been regulated on a diet and, outside of the fact that he still shows a slight amount of blood in the stools occasionally, he is in good health and keeping up in his business activities.

Summary: This is a case of a rare condtion of congenital shortening of the small intestine which occurred in a patient who also has an anomaly of intestinal rotation in the third stage with the throwing of the cecum and appendix to the left and high into the left upper quadrant. There is also a vascular anomaly with the superior mesenteric artery dilating and apparently taking over the function of the absent inferior mesenteric artery.

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The meeting adjourned.

A. G. Schulze, M.D., *Secretary.*

Tuberculosis Among College Students

During 1937-1938 over 64,000 students were given tuberculin tests with 25.8 per cent showing positive reactions. Since 1932-33 when the first figures were collected there has been a steady increase in the number of tests and a slow but steady fall in the percentage of reactors. "The value of the tuberculosis program to the individual student, whether he be the patient or the protected, is incalculable," reports the Committee. "The effort of finding tuberculosis is justified by the educational value alone. It is a demonstration of how lives can be saved and the community safeguarded. This is hygiene that actually operates." Ann'l. Rep. Tuber. Comm. of Amer. Student Health Assn., 1937-1938.

BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

BOOKS RECEIVED FOR REVIEW

Otolaryngology in General Practice. Lyman G. Richards, M.D., Fellow in Otology, Courses for Graduates, and Assistant in Surgery, Harvard Medical School, Associate Professor of Otolaryngology, Tufts Medical School, etc. Foreword by D. Harold Walker, M.D., Professor Emeritus of Otology at Harvard Medical School, Past President of American Otological Society, etc. 352 pages. Illus. Price, $6.00 cloth. New York: The MacMillan Co., 1939.

Cancer of the Colon and Rectum. Its Diagnosis and Treatment. Fred W. Rankin, B.A., M.A., M.D., Sc.D., F.A.C.S., Surgeon, St. Joseph's and Good Samaritan Hospitals, Lexington, Ky., and A. Stephens Graham, M.D., M.S., (in Surgery), F.A.C.S. Surgeon Stuart Circle Hospital, Richmond, Va., Assistant Professor of Surgery, Medical College of Virginia. 358 pages. Illus. Price, $5.50, cloth. Springfield, Ill.: Charles C. Thomas, 1939.

Medical State Board Examination. Topical Summaries and Answers. Fourth Edition. Harold Rypins, A.B., M.D., F.A.C.P. Secretary New York State Board of Medical Examiners; Member National Board of Medical Examiners, etc. 448 pages. Price, $4.50, cloth. Philadelphia: J. B. Lippincott Co., 1939.

Manual of the Diseases of the Eye. For Students and General Practitioners. Sixteenth Edition. Charles H. May, M.D., Consulting Ophthalmologist to Bellevue, Mt. Sinai and French Hospitals, N. Y.; Formerly Chief of Clinic and Instructor in Ophthalmology, Medical Department of Columbia University. With assistance of Charles A. Perera, M.D., Instructor in Ophthalmology, College of Physicians and Surgeons, Medical Department of Columbia University, New York. 515 pages. Illus. Price, $4.00, cloth. Baltimore: William Wood & Co., 1939.

Treatment By Diet. Fourth Edition, Revised. Clifford J. Barborka, B.S., M.S., M.D., D.Sc., F.A.C.P. Department of Medicine Northwestern University Medical School, Chicago; Formerly Consulting Physician, the Mayo Clinic. 691 pages. Price, $5.00, cloth. Philadelphia: J. B. Lippincott Co., 1939.

WHAT IT MEANS TO BE DOCTOR. Dwight Anderson. Cloth, 96 pages, $1.00. Paper cover, twenty-five cents. Public Relations Bureau, Medical Society of the State of New York, 2 East 103rd Street, New York, New York.

This little book, using the story form in a large part of its make-up, is good for any doctor to read—young or old—but it is especially one which should be read by his inquiring patients.

When people are being told in the public press that state medicine is a progressive move to make medical care available to all, at Government expense, they can't understand why doctors oppose such a thing. It seems fair enough. The doctor would be paid by the Government; more people would go to the doctor without fear or financial worry. Plainly enough people need to be told why, in simple terms. As the author says, "Most people know what it means to be a patient. Few stop to consider what it means to be a doctor." When people read that a large percentage do not receive medical care, they accept the statement without question and exclaim, "How terrible." Analysis of the statement does not interest them. They do not know they are being asked "to judge the doctor on meager information and to decide whether he is right or wrong in resisting the tendency toward state medicine. Without more knowledge of him it is difficult to weigh the value of his opinion."

Four queries asked in a questionnaire sent to five hundred physicians met with a generous response. "If you had a son would you wish him to select medicine as a career?" was one. The comments in the replies are discussed in an interesting manner. In the interest of the traditional doctor-patient relationship, the author has this to say: "As we come to understand him better, of one thing we are increasingly aware: that what happens to the doctor also determines what happens to the patient. Their interests are the same."

Arthur N. Collins, M.D.

ORGANIZED PAYMENTS FOR MEDICAL SERVICES. By the Bureau of Medical Economics, American Medical Association. Paper. Pp. 185. Chicago: American Medical Association, 1939.

It would stretch the imagination of a social planner to devise any scheme for the organized payment for medical services that is not described in this publication of the Bureau of Medical Economics of the American Medical Association on "Organized Payments for Medical Services." Several hundred plans for medical care of the indigent involving governmental support and medical society management are explained. Social Security legislation has brought about changes in medical arrangements reaching into almost every locality in the United States and affecting health departments, medical societies, and state and local governments. Types of plans proposed by the Farm Security Administration to provide medical services to Administration clients in 127 counties and covering 100,000 low income families are described. Medical societies have organized postpayment and prepayment plans of medical care offering a wide selection of types. Some provide for a cash indemnity to be paid to the insured with which he can purchase his own medical service, and others provide medical service directly.

Industries, unions, fraternal organizations, and all sorts of mutual societies provide medical benefits for their members by a variety of prepayment devices. Some 3,000,000 persons are covered by group hospitalization plans, which show a wide variety of relations with state and county medical societies. Commercial insurance companies, all of whom pay benefits in cash, are also entering this field on a large scale. It is estimated that approximately $300,000,000 in cash is paid out annually by insurance companies to assist in paying medical bills.

The House of Delegates of the American Medical Association has endorsed cash indemnity prepayment plans, but has not sought to prohibit any of its component societies from coöperating with or organizing other types of prepayment for medical service, provided their character is not such as to render it impossible to give good medical service.

The number and variety of the plans for medical services—operating and proposed, postpayment and prepayment, service and cash, medical society and other organization sponsored—give proof of the efforts of are being made to supplement the private practice of medicine and indicate a desire to discover, by social experimentation, a solution of local medical problems.

TRAUMA AND INTERNAL DISEASE. Frank W. Spicer, A.B., M.D. F.A.C.P. 593 pages. Illus. Price, $7.00. Philadelphia: Lippincott, 1939.

The purpose of this book as expressed by the author is to develop investigations into the subject of trauma as etiological factors in post-traumatic complaints and conditions of the injured. He recommends that painstaking impersonal scientific inquiry should and must be made before an ultimate decision can be reached as to the relative importance of antecedent trauma to existing disease.

The book is well-planned to cover the field undertaken. It takes up first the consideration of trauma to the brain and then considers the effect of trauma upon the spinal cord. In this way, he discusses the subject of trauma at its most controversial angles.

To the reviewer, the chapter on trauma to the heart was very interesting. The cardiologist and the industrial surgeon frequently disagree in a way that is not easy to understand. Both can learn much that will benefit victims of heart disease and sufferers from trauma by reading this chapter. The author here, as elsewhere, quotes liberally from authorities to sustain the conclusion that heart strain causes an alteration of the texture of the heart muscle.

The book is decidedly a reference book and is of great value to medical men preparing to sustain their contentions in disputed cases. It will probably have a great appeal also to lawyers. A marvelous table of references is appended to each chapter covering the medical and surgical literature of all languages. Treatment is not considered in the text.—R. M. Burns, M.D.

Tuberculosis and Tonsils

Sixty-one individuals from whom tuberculous tonsils or adenoids had been removed in the years between 1912 and 1920 were investigated in 1935 at the Johns Hopkins Hospital. Of the forty-five who were less than fourteen years of age when the operation took place but one had died from tuberculosis and forty-two were alive and well. Of sixteen patients who were past the age of fourteen more than half had suffered from pulmonary tuberculosis of the adult type. Incomplete examinations at the time of operation made it impossible to determine in how many cases the disease was already present in this older group. What did seem apparent was that after removal of the tuberculous focus, the children under fourteen rarely showed progressive tuberculosis of the adult type.—Bordley, J., III, and Baylor, John W., Bull. Johns Hopkins Hosp., 1938, 63.

MINNESOTA STATE MEDICAL ASSOCIATION

Eighty-sixth Annual Session

May 31, June 1 and 2, 1939

Minneapolis, Minnesota

HOUSE OF DELEGATES

Tuesday, May 30, 8:30 p. m.

The first session was called to order by Dr. W. W. Will of Bertha, Speaker of the House, at 8:30 p. m. Tuesday, May 30, 1939.

Following a report by Dr. B. A. Smith of Crosby, Chairman of the Committee on Credentials, showing that a quorum was present, a telegram was read from Dr. Rock Sleyster, President of the American Medical Association, regretting that developments in Washington would prevent him from being present and extending greetings to the delegates.

By motion, duly seconded and carried, reading the minutes of the last meeting of the House of Delegates was dispensed with and the Speaker appointed the following delegates to serve on the Resolutions Committee: Dr. Victor Hauser of St. Paul, Chairman, Dr. John Helland, Spring Grove, and Dr. Harry Klein, Duluth.

At the request of Speaker Will, Dr. George Earl of St. Paul, President of the Minnesota State Medical Association, addressed the delegates as follows:

Mr. Speaker, and Members of the House of Delegates:

As President of the Association, my experiences of the last year have been new though many years of service on the Council had already given me a considerable familiarity with the work of the Association. It seems to me, as a result of this experience, that too often the things we know best, we least appreciate. It is so with our own wives and families, with our partners and business associates and also with our associates in this organization, our officers, councilors, committee chairmen and delegates. As members, we often take too much for granted the results obtained through the hard work of all these officers and especially the loyalty of our full-time workers.

Mr. Rosell, our Executive Secretary, has established himself, I may say without fear of contradiction, beyond our expectations. The change in office which was made after Doctor Meyerding's fourteen years of faithful service created some difficult situations and Mr. Rosell has carried on with great success. He informs me that our membership is 115 more than at this time last year and the reports of your Secretary, Treasurer and the Chairman of your Council will show the affairs of the Association to be in a very satisfactory condition.

Mrs. Fitzgerald has been with us for ten years. Her experience and abilities you know. Mrs. Marion Hale has returned to the office after a short period of absence, having served the Association previously, and Mrs. Sylvia Holliday has likewise been with us for a considerable period of time. We are fortunate indeed in having these two young women who are experienced, able and loyal.

I am not going to mention all to whom I have felt indebted during this first period of office, the officers, the councilors, the Treasurer, the committee chairmen and others. However, having mentioned our full time executive it is certainly in order to mention Doctor Sogge and Mr. Brist, whose special part time service places them in a distinctive position in relation to other officers. Time does not permit more than this mention but they are well aware of the gratitude our Association feels toward them. You have all personally so expressed yourselves to them.

In closing, I want to thank Doctor Souster, our Secretary, also, for his efficient work and for his wholehearted coöperation. His position is a new one and he has more than made good.

We need the loyalty of all these people at this particular time. I am sure that this House of Delegates under the leadership of Doctor Will is going to have a most interesting session and I know also that we will go forward and accomplish results.

Doctor Will: At this time I should like to call on Doctor Sogge, who knows better than anyone else who some of our friends are and what they mean to us, to introduce one very good friend and tell what he has done.

Doctor Sogge: Doctor Earl was very generous in his praise of Mr. Brist and myself. But I want you to understand right here and now that if we didn't have very loyal and capable men in the House and Senate to whom we could turn we wouldn't get very far. Tonight we have the honor of having with us a state senator and member of our own profession who is highly respected in the Senate. When he stands for or against a bill it means a tremendous lot in the Senate because they know how well he is posted on what is best for the public health and they follow his advice. I want you to meet our senator, Doctor Oliver.

Dr. C. I. Oliver: Doctor Sogge's remarks are all undeserved, I'm sure. I assure you that as long as I am in the Senate and, if I live, I'll surely be there three years longer, I'll make the greatest effort to do everything I can for the State Society.

Doctor Will: I'm sure you're all agreed that the most important questions before us this year are national questions. I am therefore going to switch the order of business a little so that none of you will miss the reports of our delegates to the American Medical Association. Doctor Coventry.

Doctor Coventry: The Ninetieth annual meeting of the American Medical Association held in St. Louis, May 15, 16 and 17, was very harmonious. The report of the Secretary, Dr. Olin West, revealed the greatest percentage of increase in members on record during the past year. The total on March 1, 1939, was 112,210. The impression seems to be that agitation against the American Medical Association has really stirred up the doctors of the country to get into the fold and face the issue with the rest of the members. To be sure, there is still much to be done in the state of Minnesota to bring new members into our state society and as a consequence, of course, into the American Medical Association.

The financial condition of the organization is very good. The income in 1938 was larger than in 1937 though the total expenditures, due largely to litigation, were also much larger than in 1937.

The high standards of the JOURNAL will be maintained and Doctor Fishbein will be retained as editor. There was no outward or inward agitation that I could perceive against Doctor Fishbein. The decision in the case of Brinkley versus the American Medical Association has helped considerably to sustain his position and prestige. The special magazines published by the Editorial Department are in a pretty fair way financially. Though not all of them are on a paying basis, they are all of the highest type scientifically and warrant more support from the membership at large.

At times one may have been slightly skeptical of the relations of the American Medical Association with the food industries in general. By and large, in the majority of cases, the committee on foods has worked out very satisfactorily, however, and it certainly must be a great protection to the public to know that many false claims about food are retracted by all industries that wish to profit in the long run.

Prepayment or group payment medical service plans thus far considered by medical societies can be classified into two main types: (1) Unit service plans which provide medical services by physicians who agree to accept a pro-rated division of whatever funds are available after administrative and other expenses are paid; (2) Cash indemnity plans which provide a designated amount of cash to assist members of the plan to meet their medical bills. Experience gained by medical societies with each of these types of service will, no doubt, produce much helpful information.

Group hospitalization plans organized by hospital administrators and physicians have continued to receive widespread attention. One major problem in connection with these plans is concerned with the question of including or excluding special medical services such as anesthesia, pathology and radiology. Experience already obtained in operation of these plans emphasizes the importance of the recommendations of the House of Delegates that such special medical services be omitted from a hospital service contract or included only on the basis that cash benefits be payable directly to the specialist who renders the service.

The development of medical service plans raises a further question as to the relation between hospital service plans and such other medical services as the general medical and surgical services rendered in the hospital. The consensus seems to be that a medical service plan should be kept separate in its organization and administration from a hospital service plan. All of these plans have brought into sharp focus the necessity for establishing clear relationships between the departments of anesthesia, radiology, pathology and physical therapy and the physicians practicing in these departments.

An exhaustive study and report on medical fee schedules has been made, in accordance with the request of the House of Delegates. This study is based on all of the county society fee schedules that could be obtained, classified and tabulated into a composite table with minimum, average and maximum fees for each of the 606 items covered.

Another special study on collecting medical fees has been made as a result of the recent development of credit and collection bureaus organized under auspices of medical societies or groups of physicians. The study covers, also, various procedures used by commercial collection agencies with especial emphasis upon the practices used to defraud the unwary physician.

All physicians are urged to familiarize themselves with the preferable procedures as outlined in this study when a third party agency is used to collect medical accounts.

Development of special medical finance plans under county society auspices or under groups of physicians is also a recent interesting development. Careful study should be given to all of the lending agencies available to patients and to the possibility of medical society sponsorship.

Policies and rates for malpractice insurance have been subjected to considerable changes in the past few years due to increasing underwriting losses and to the present unsettled situation in which recent attempts to discredit the medical profession are undoubtedly a factor.

Newspaper headlines to the effect that the American Medical Association refused to seat women physicians in the House of Delegates were entirely misleading. Any woman physician who is elected as delegate of her state society can be seated in the House of Delegates. The request of the American Association of Women Physicians to have representation was refused because all women physicians should be members of the American Medical Association with the same opportunities and rights as men. If the American Medical Association let down its bars to seat delegates from the Women's Association, other associations would spring up and demand representation. Similar requests might be made by associations of cleft palates or of the hard of hearing or even of baldheaded physicians. The principle maintained is perfectly correct and the same principle applies to Negro physicians who were brought up in the discussion. Negro physicians also have the right to sit in the House of Delegates provided they are duly elected by their local societies. This, of course, would not happen in the South but it might well happen in the North. There is no discrimination whatever so far as the American Medical Association is concerned against Negro physicians. There is a group known as the Association of Negro Physicians which has asked to be allowed the same privilege of free choice for their patients as white people have. It was thoroughly agreed that Negro physicians should have the same privileges as anybody else as allowed under the laws of their own states.

The chief topic of discussion was, of course, the Wagner Health Bill. I trust that all of you have studied this bill carefully because the phraseology is guarded and holds possibilities for development of many plans leading to complications so far as the practice of medicine is concerned. The American Medical Association still believes that all attempts at control should originate within the state and that subsidies by the Federal government are dangerous. The reference committee on the Wagner Bill held many long sessions and finally brought in a report which was unanimously approved which I am giving here only in summary as follows:

1. The Wagner Health Bill does not recognize either the spirit or the text of the resolutions adopted by the House of Delegates of the American Medical Association is September, 1938.

2. The House of Delegates cannot approve the methods by which the objectives of the National Health Program are to be obtained.

3. The Wagner Health Bill does not safeguard in any way the continued existence of the private practitioners who have always brought to the people the benefits of scientific research and treatment.

4. The Wagner Health Bill does not provide for the use of the thousands of vacant beds now available in hundreds of church and community general hospitals.

5. This Bill proposes to make federal aid for medical care the rule rather than the exception.

6. The Wagner Health Bill does not recognize the need for suitable food, sanitary housing and the improvement of other

environmental conditions necessary to the continuous prevention of disease.

7. The Wagner Health Bill insidiously promotes the development of a complete system of tax supported governmental medical care.

8. While the Wagner Health Bill provides compensation for loss of wages during illness, it also proposes to provide complete medical service in addition to such compensation.

9. The Wagner Health Bill provides for supreme federal control; federal agents are given authority to disapprove plans proposed by the individual states.

10. The Wagner Health Bill prescribes no method for determining the nature and extent of the needs for preventive and other medical services for which it proposes allotments of funds.

11. The Wagner Health Bill is inconsistent with the fundamental principles of medical care established by scientific medical experience and is therefore contrary to the best interests of the American people.

12. The fortunate health conditions which prevail in the United States cannot be disassociated from the prevailing standards and methods of medical practice.

13. No other profession and no other group have done more for the improvement of public health, the prevention of disease and the care of the sick than have the medical profession and the American Medical Association.

14. The American Medical Association would fail in its public trust if it neglected to express itself unmistakably and emphatically regarding any threat to the national health and well being. It must, therefore, speaking with professional competence, oppose the Wagner Health Bill.

15. The House of Delegates would urge the development of a mechanism for meeting the needs for expansion of preventive medical services, extension of medical care for the indigent and the medically indigent, with local determinations of needs and local control of administration, within the philosophy of the American form of government and without damage to the quality of medical service.

16. The fundamental question is how and when a state should be given financial aid by the Federal government out of the resources of the states as a whole, pooled in the Federal Treasury.

17. The bizarre thinking which evolved the system of Federal subsidies—sometimes called "grants-in-aid"—is used to induce states to carry on activities suggested frequently in the first instance by officers and employes of the Federal government.

18. The use of Federal subsidies to accomplish such Federally determined activities has invariably involved Federal control.

19. Any state in actual need for the prevention of disease, the promotion of health and the care of the sick should be able to obtain such aid in a medical emergency without stimulating every other state to seek and to accept similar aid, and thus to have imposed on it the burden of Federal control.

20. The mechanism by which this end is to be accomplished, whether through a Federal agency to which any state in need of Federal financial assistance can apply, or through a new agency created for this purpose or through responsible officers of existing Federal agencies, must be developed by the Executive and the Congress, who are charged with these duties.

21. Such a method would afford to every state an agency to which it might apply for Federal assistance without involving every other state in the Union or the entire government in the transaction.

22. Such a method would not disturb permanently the American concept of democratic government.

Dr. Nathan Van Etten, who has been former Speaker of the House of Delegates and whom it was our pleasure to meet at our Annual Meeting two years ago, was named President-Elect of the American Medical Association. He is a very scholarly gentleman from New York City and is the first general practitioner of medicine to have been elected in many years. All other officers were re-elected except Dr. A. H. Bunce, who was automatically retired from the Board of Trustees by rule of the American Medical Association, which allows a man to serve only two successive terms or ten years on the Board. Dr. E. L. Henderson from Kentucky was elected in his place.

By and large the meeting went off very successfully with exhibits and papers very much up to par. Commercial exhibits were better than usual and the attendance this year was better than it has been for a long time, a fact which spoke well for the interest of the Mid-West section. Next year's meeting will be in New York City, the year after in Cleveland and at this session we decided to go to Atlantic City in 1942, following the new custom instituted last year of choosing meeting places well ahead.

I shall be very glad to communicate with any of you who wish any further information I may have.

Doctor Will: Thank you for a fine report, Doctor Coventry. And now Doctor Meyerding (alternate for Doctor Christison, retiring delegate).

Dr. E. A. Meyerding: What impressed me most at this meeting was the harmony exhibited. There were no rumors, even, of any conflicts. There was no contest for any office. On one afternoon, only, the House of Delegates got on its hind legs and turned down every reference committee recommendation that came in. That was interesting and the House of Delegates was right in each case.

I was interested in what Doctor Taylor of Texas said in reference to the discussion about representation for Negro physicians. Most southern organizations have liaison committees with the Negro organizations, Doctor Taylor said. The white and Negro physicians work in harmony in these committees and Negro physicians appear frequently with problems for discussion and solution.

The finances of the American Medical Association have been hit as they never were before this year. It is the first time that I ever remember report of a deficit and it is due of course to litigation. The case of Brinkley versus Fishbein is interesting—most of you have read about it—but it is not the only one. Unfortunately the profession is being attacked just as big business was and the attacking group, whether official or unofficial, has the highest paid propaganda organization in the world. It was rumored that the cost of the lawsuits would run to a quarter of a million dollars.

In Minnesota we have some 3,426 licensed physicians and the *Journal of the American Medical Association* goes to 1,994, a creditable number.

Dr. Coventry mentioned the Councils of the American Medical Association. They exemplify the American way of doing things by unofficial groups undominated by politics or bureaucrats. The more we turn our educational and protective measures over to the bureaucrats the more we line up as they do under Hitler.

When I came back I heard this remark two or three times: "I hear they're going to oust Fishbein." There wasn't a word spoken against Doctor Fishbein at this meeting. The organization is stronger for him than ever.

The report of the Committee on Motor Vehicle Accidents concerning tests for alcohol interested me very much; also the resolutions on the ethics of plans for periodic payment for medical care proposed by the Judicial Council and passed by the House. No plan for provision of medical care to low income groups is sound unless it conforms to medical ethics and if there is any doubt as to the ethical soundness of any plan the Judicial Council should be consulted in advance. I was interested, also, in the action of the House which rejected the recommendation made by the reference committee to approve schools of chiropody. Dr. Campbell, orthopedist of Memphis, objected emphatically in a manner that reminded me of Herman Johnson, whose contention was always that no cult should ever be recognized. Dr. Campbell remarked that there are schools now for x-raying every part of the body and for use in treatments. Often use of x-ray is dangerous and these schools should not be encouraged. Such teaching should all be done by medical men in standard courses.

The term "diagnostic clinic" as understood by medical men was defined in contrast to the diagnostic clinic contemplated in the National Health Program. What Washington really means by the term nobody knows. What the Judicial Council terms a diagnostic clinic is an organization of physicians whose sole work is to make or supervise diagnostic examinations of patients referred to the clinics by doctors of medicine or to coöperate in general diagnostic surveys. Reports on tests of patients are made only to the referring physician unless he requests that the case and recommendations for treatment be discussed with the patients as part of a professional consultation, in which case discussion is only by a staff member of the clinic. Every examination, test or x-ray procedure should be made by or under the supervision of a physician specializing in the field and every diagnostic laboratory, so-called, must be directed by a licensed physician to be recognized. The control of a clinic must be vested in one or more members of the professional groups and profits are to be apportioned only to the members of the staff actually engaged in work of the clinic. No dividends, bonuses or salaries should be paid any individuals except for services rendered. The clinic must be governed in its activities by the same ethical principles that apply to individual members of the American Medical Association.

A thousand or more new beds will be added to Veterans' Administration Facilities this year. The report indicated that the beds are needed but the principle established by Dr. Wright and some of the rest of us some years ago when we were discussing Veterans Bureau matters is particularly important now —that vacant beds in private hospitals be used before new beds and institutions are established.

Farm Bureau insurance plans were discussed and by no means endorsed. The plans differ in the different states and counties where they have been tried. In some they appear to have worked where they have been under medical management. Many of the principles involved are objectionable, however, and the committee reporting on the matter recommended that all contracts should be made by local county societies because the problems involved are local. Contracts should be submitted to the state associations for study and suggestions and also to the American Medical Association. The Bureau of Medical Economics will gladly give information on the matter and study the contracts if their assistance is requested.

Delegates at St. Louis were met with newspaper headlines reporting the statement of Henry Ernest Sigerist of Johns Hopkins that "health is a public concern and no fee for services system is any longer adequate to conserve it." This was interesting in view of the fact that consideration of the Wagner Health Bill was the main business of this session. I sat in on committee sessions on this bill and was disappointed to hear, at first, that the bill was badly needed. This testimony was from southern representatives principally. Then Father Schwitalla, dean of the St. Louis University School of Medicine and head of the Catholic Hospital Association, talked. He declared without mincing words that the bill would be the end of the old private hospitals and the end of the private practice of medicine. He said that he had studied the bill as it related to hospitals and had tried to write amendments to it that might make it acceptable. He had written no less than 50 amendments to the bill and then had found that it would be impossible to amend it and it would have to be re-written. Mr. Blake of the Protestant Hospital Association said he had more amendments to offer than Father Schwitalla, and Monsignor Griffin, trustee of the American Hospital Association and vice president of the Catholic Association, was even more emphatic than the other two in opposition to the bill. Monsignor Griffin said, and other speakers agreed with him, that undoubtedly there are sections of the country that require assistance; but this assistance could be given without wiping out our entire medical and hospital organization which has brought about such great progress in the care of the sick in the United States today. Everyone of you should take advantage of the opportunity to hear Monsignor Griffin at this meeting.

The reason I have spoken so long on this matter is that we're up against a serious menace. The same type of legislation may come up in our own legislature. The only people who can stop it are your Congressmen and yourself. You can't wait.

Doctor Will then called upon Dr. C. B. Wright of Minneapolis, trustee of the American Medical Association.

Doctor Wright: It is a great satisfaction to me, as a member of the Board of Trustees, to hear these excellent reports. We need your coöperation if we are going to carry on. And by you, I mean, the members of the American Medical Association everywhere. I recall a Board Conference of the American College of Surgeons at which a member discussed the American Medical Association as though it were an outside organization. Someone else got up and said: "I would like to remind you, Dr. So-and-So, that you are a member of the American Medical Association and you have just as many rights and privileges in it as any other. So, for God's sake please talk about it as if it were yours as well as mine."

I understand that the Senate committee, which held the hearings on the Wagner bill, as a whole was very unsympathetic with the doctors except for one man, Senator Taft, who was very considerate and very much interested in getting the viewpoint of the medical profession. On the whole, the hearing has been very successful. Such men as Dr. Sleyster, Dr. Abell, who makes a wonderful presentation before any gathering, Drs. Gordon Heyd of New York, Johnson of Virginia, Donaldson of Pennsylvania, were there. Mr. Crownhart is going, I believe, also, and many representatives of individual states. Before they get through I'm sure we shall have had a very creditable showing.

I would like to say a word about the status of our smear suit. The government has done nothing since they got an indictment. And it was a great accomplishment to get the indictment before a Christian Science judge. The American Medical Association has assumed all of the expense of the defense for the District of Columbia and the able attorney who has charge of the case has argued a demurrer. There is some reason to believe that the whole case may be quashed. The judge has it under advisement now and is going to make his final decision soon. If he refuses to quash the indictment, it will be carried to the Supreme Court of the United States. We should find out definitely where we stand, I believe.

They have been in our offices, you know, and subpœnaed our records. At first they wanted our records back to 1915. Actually they demanded them from 1928. That meant that everything had to be photostated at a cost of $12,000 to $15,000. That was the first bit of unpleasantness. Then they declared that we were subject to the income tax as a business corporation. We're fighting that before the tax commission now.

At the time the demurrer was being argued a man from the Department of Justice told what had been found in the records in a newspaper interview. If we had done that we should have been in contempt of court. It will cost anywhere from $100,000 to $125,000 to defend this suit. The man who was responsible for it is said to have remarked upon being asked what he was going to do next: "Well, I think I've done about as much as I can do. It'll cost you a lot of money and it's made a lot of trouble for you. I don't know whether we can go any further or not."

The interesting thing is that as soon as we were attacked our membership jumped and our men came closer together. We've had offers of money to help. One little society of eight members in Florida sent $10, saying, "now if the rest of the boys chip in, that's going to give you a pot to work on." The *Journal* was raised a dollar a year as you know. A few wrote in to object but the subscriptions immediately jumped and are higher today than ever in the history of the organization.

I think we're going to come out all right. If we are right—and there isn't any question in my mind but that we are right—we will eventually be vindicated by the Supreme Court and the people of the United States.

Doctor Braasch, delegate, was not present to give a supplementary report.

Doctor Will called for the report of Dr. H. Z. Giffin, chairman of the Council, concerning the council meeting which preceded the session of the House of Delegates.

Doctor Giffin: In general, the financial condition of the association is very good as will be indicated to you by the report to be given by the treasurer, Dr. W. H. Condit. A surplus of $1,263.70 was reported for the first quarter for Minnesota Medicine though this surplus will doubtless be reduced slightly before the end of the year. The Investment Advisory Agency now amounts to $34,700, $4,000 having been added to it this year. It has been necessary to pay back Social Security taxes for three years to the amount of over $900. This tax will increase the annual expenses of the association between $300 and $400.

The Council expressed its interest in the Physicians' Committee for Free Enterprise in Medicine organized by the National Committee to Uphold Constitutional Government but gave it no official recognition or authorization inasmuch as this is essentially a lay organization.

The Council also went on record as having no objection to coöperative services on a county basis provided they were directed by and satisfactory to the local medical society concerned.

It was decided that the President should be empowered to appoint a special committee to study various phases of motor vehicle accidents. Also that the roster should continue to be sent to probate judges of Minnesota; that termination of any type of membership with the exception of honorary membership in the local society should automatically terminate membership in the state society.

The following resolution was passed in response to a request from a county society for approval of extension of group hospital insurance to a hospital in its community: "That extension of hospital insurance through the Minnesota Hospital Service Association to hospitals in any community is entirely a local matter and should be approved by the component medical society concerned."

A resolution requesting Congress to make necessary appropriations for the new building already authorized for the Army Medical Library in Washington was approved to be sent to Minnesota members of Congress and other interested officials. An invitation from the United States Pharmcopœial Convention Incorporated to appoint a committee to assist in the revision of the Pharmacopœia was accepted, with the president designated to appoint a committee of three. Also, the invitation of the Minnesota House of Representatives to appoint a committee to work with a committee of the Minnesota State Bar Association in a study of psychopathic personalities, looking to enactment of further legislation to control, regulate, segregate, treat and deal with such persons.

In response to a complaint by the State Board of Health regarding laxness among physicians in registration of births, the Council suggested that offending physicians be reported to the State Board of Medical Examiners for disciplinary measures, that a news letter be sent to the membership on the matter and that a story be sent out to all newspapers through the regular news service on the subject.

Complaints were also reported by the Secretary that physicians were not in all cases coöperating with druggists in carrying out provisions of the barbiturate law. The Council directed that the Minnesota State Pharmaceutical Association be instructed to report offending physicians to the State Board of Medical Examiners for discipline.

A resolution endorsing the stand of the American Medical Association against the Wagner Health Bill and submitted by the executive committee of the Hennepin County Medical Society was approved for submission to the House of Delegates.

The Council agreed to recommend the name of Dr F. J. Savage of St. Paul for delegate to the American Medical Association as successor to Dr. J. T. Christison of St. Paul, retired, with Dr. J. M. Hayes of Minneapolis, as alternate, both to be submitted for action to the House of Delegates.

Drs. J. M. Robinson and E. L. Cheney of Duluth and Dr. C. E. Henry of Kirkville, Missouri, formerly of Minneapolis, were granted affiliate membership and the Council decided to provide all affiliate members with a permanent affiliate membership card.

Doctor Giffin's report was accepted by the House.

Doctor Will: The committee reports are next on the order of business. I think it might be well to call the attention of the delegates again to the fact that this is no cut and dried affair. The various reference committees have been appointed to expedite the business of the House but all of the reports have been in your hands. You have had an opportunity to study them and your remarks will be very gladly received.

The report of the reference committee on Medical Education, of which Dr. A. E. Cardle of Minneapolis is chairman, covered the following reports:*

COMMITTEE ON HOSPITALS AND MEDICAL EDUCATION

With postgraduate education organized as effectively as it is in Minnesota with the University Center for Continuation Study and extension and public health courses, the field of postgraduate education is adequately covered. The work of this committee this year has therefore been devoted to organizing the dissemination of information on stated monthly topics. The program has worked very well so far. The response on the part of the membership and constituent societies has been good. Between 200 and 300 packets have been sent out each month and there is a regular mailing list of 56.

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*All committee reports appear in somewhat abbreviated form.

Presumably this type of work will be continued in the future.

J. B. Carey, *Chairman.*

COMMITTEE ON SYPHILIS AND SOCIAL DISEASES

The Committee on Syphilis and Social Diseases has discussed plans for a program of instruction in venereal diseases to be financed by federal funds with representatives of the Minnesota Department of Health and the University Medical School as speakers. The program proposed is similar to the postgraduate program sponsored by the Division of Child Hygiene of the Department of Health and the Minnesota State Medical Association. Meetings are planned for various centers throughout the state, with a one-day program arranged for each and sponsored by the above agencies.

In a few states there has been legislative action to require pre-marital Wassermann tests and tests for all pregnant women. If such bills should be introduced in the legislature of Minnesota, the profession should try to direct it along reasonable lines.

F. W. Lynch, *Chairman.*

COMMITTEE ON CANCER

To remove public fear of cancer and substitute for it an enlightened knowledge of how to control and cure malignant disease is the aim of this committee. To bring about realization of this aim, the committee has worked closely with the Women's Field Army Against Cancer and all physicians in the state are urged to assist the Field Army in its educational campaign in a uniform manner so that all may be told the truth about the disease without promoting harmful hysteria. To that end the committee previously prepared a model talk on the subject and distributed it to all members so that public statements by physicians on this vital matter might not be in conflict. The committee has aided this year in preparation of material for the State Association's cancer education month in April and provided speakers for meetings on the subject throughout the state. The committee also participated in the St. Paul meeting of the Women's Field Army which initiated its membership campaign this year.

The executive committee of the Women's Field Army is made up of the chairman of this committee, representatives of the Council and officers of the State Medical Association and the treasurer of the Field Army, Mr. Louis Hill, Jr., who has been very helpful in rendering aid and advice to the organization. The committee is indebted to Mrs. Harlow J. Hanson, state commander of the Field Army, and to Dr. H. E. Robertson of Rochester for providing speakers and assisting in arrangements for speakers in his section of the state.

Martin Nordland, *Chairman.*

COMMITTEE ON DIABETES

At the last annual meeting it was decided to continue to send out the booklet published several years ago by the Committee on Diabetes and plans were made to provide an exhibit at the 86th annual session in coöperation with the Minnesota State Dietetics Association showing food in equivalent amounts by actual samples. It was decided to include an insert in the booklet warning patients against changing to protamine insulin without the assistance of a physician.

Horatio B. Sweetser, Jr., *Chairman.*

(At a meeting held in conjunction with the 86th annual session but subsequent to the presentation of this report the Committee decided to publish a new edition of the booklet, the old edition being nearly exhausted.)

COMMITTEE ON DEAFNESS PREVENTION AND AMELIORATION

The Committee has encouraged incorporation in the school health program of audiometric testing of school children by demonstration surveys, by participation in public health meetings and by loan of equipment for continuation surveys in communities where it has not been possible to purchase audiometers.

Numerous addresses have been made before groups of University faculty members, public health nurses, social service workers, medical students, nurses in training and parent teacher associations. A broadcast was also given over WLB under sponsorship of the State Association and the Hennepin County Medical Society in connection with the Minnesota State Conference of Social Work.

Funds should be made available, if possible, for finding the children in rural areas who are hard of hearing, also for correcting their hearing defects. Considerable progress has already been made toward securing social security funds for the purpose, though final arrangements will have to await reorganization of the state agencies in charge of welfare and public assistance.

A new pure-tone audiometer for detecting hearing loss is now available at a moderate price by which large numbers can be accurately checked by individual tests in a minimum period of time.

There is a very noticeable increase in interest in efforts to conserve hearing as manifested by the larger demand for information and assistance in instituting work in this field of public health work.

The Committee wishes to express its appreciation of the generous coöperation of Mr. Leonard M. Elstad, Superintendent of the State School for the Deaf, and his associate, Mr. R. W. Farrar; also the technical advice of Professor Henry E. Hartig of the School of Electrical Engineering of the University of Minnesota.

In view of the growing interest in the work it is recommended that the work be continued and that the Committee have permission to reduce or enlarge its personnel with the approval of the Council so as to include additional members who manifest a special interest in its activities.

Horace Newhart, *Chairman.*

COMMITTEE ON MATERNAL WELFARE

Work of the Committee during the past year has been largely coöperative. With the State Department of Health it has collaborated in preparation of a "packet" on maternal health for the month of May. It has helped to promote interest in the coming American Congress on Obstetrics and Gynecology to be held in Cleveland in September. It has also represented the Association in the arrangements for presentation of the Postgraduate Course for Physicians in Obstetrics and Pediatrics in ten centers this year throughout the state.

Robert D. Mussey, *Chairman.*

Doctor Cardle: This committee, consisting of J. R. Aurelius, Waltman Walters, C. L. Roholt, C. O. Maland and the chairman, separately considered each of the above reports as follows:

In connection with the report of the Committee on Hospitals and Medical Education, we wish to commend the work being done by the University Center for Continuation Study under the direction of Dr. William A. O'Brien and we hope he will continue to enlarge his activity in postgraduate education to adequately take care of the needs of the profession. More interest by the profession should be shown in the packet information sent out by the State Office. It is the duty of every member to avail himself of this service. The committee finds nothing in this report regarding hospitals. If this is not to be covered in another way, we believe that Doctor Carey should send in additional information to complete his report.

(Note: Relations with the hospitals have been taken over by Council committees and by the Committee on University Relations and are therefore largely out of the province of this committee except as they contribute definitely to postgraduate education.)

Regarding the report on Syphilis and Social Diseases, the reference committee finds nothing to add to the report as presented. Doctor Roholt, who is on this committee, stated that there is under consideration at the present time a standardization of treatment for syphilis which is being discussed and which will likely be presented to the profession in pamphlet form when the details have been worked out.

Regarding the report of the Committee on Cancer, the reference committee is in complete accord as to its activity and again wishes to commend the Women's Field Army for their work.

Regarding the report on Diabetes we feel that this committee is well acquainted with the problem presented in Minnesota and that any work which they may be undertaking regarding the revision of their booklet or any other educational program has our full support. We trust they will continue their interest in this important disease.

Regarding the report of the Committee on Deafness Prevention and Amelioration, we are happy to know that such excellent work is being done in Minnesota. The State Association is very fortunate in having Dr. Horace Newhart, who not only heads this committee but has recently been elected president of the American Otological Society. His untiring efforts in this field have served to make him an outstanding authority and we know that the committee under his leadership will continue to keep this problem well covered in our state.

Regarding the report of the Committee on Maternal Welfare, the reference committee has nothing to add and feels that this work is being adequately cared for.

The reference committee on Medical Education wishes to commend the various committee members for their work and takes this opportunity to thank them for their excellent services to the State Association.

It was moved, seconded and carried that the reports be accepted.

Doctor Will: Doctor Newhart will give a supplementary report.

Doctor Newhart: I wish to express a deep appreciation for the confidence shown by officers and delegates in the work of this committee and also to propose a resolution similar to one passed by the American Otological Society in New York two weeks ago. The resolution reads:

"Whereas, it has become evident that in many communities and rural districts little or no attention has been paid by school authorities to disabilities affecting children, especially those resulting from disorders of vision, hearing and speech; be it

"Resolved: That the Minnesota State Medical Association approves and recommends the provision of funds by foundations and other appropriate agencies to carry out adequate programs for the detection of visual, hearing and speech deficiencies which constitute a handicap or a threatened handicap to school children, and, for providing through the coöperation of qualified specialists and of state, county and local medical societies appropriate medical care for indigent and underprivileged children who may be afflicted or threatened with such handicaps."

I think you see the object of the resolution—to promote the work and to keep all efforts under guidance of the profession and out of the hands of politically interested parties.

The resolution was passed by the House of Delegates as a supplement to Doctor Cardle's report.

The report of the reference committee on Miscellaneous Scientific Committees of which Dr. R. B. Hullsiek acted as chairman, covered the following reports.*

COMMITTEE ON FRACTURES

Improvement on a statewide scale in the handling of fractures is the objective of the committee. A comprehensive fracture program was outlined for the Annual Meeting by the committee with particular attention to first-aid and transportation of the injured, diagnosis, treatment and hospital equipment.

Dr. C. L. Scudder of Boston was secured as speaker for a special fracture meeting with the approval of the committee as a feature of the program.

Organization of fracture committees in each component society of the Association is also part of the program of the committee in carrying out its objective. Every society was asked to appoint a representative for an organization dinner and this general committee will carry back to the societies a program of education for the profession, the hospitals and the public in the preliminary handling and subsequent treatment of fractures.

F. J. Elias, *Chairman.*

HISTORICAL COMMITTEE

Your committee has not secured any additional material during the past year but manuscripts have been prepared for publication in Minnesota Medicine. During the past year histories of medicine in St. Louis County, the "Iron Range" and Washington County, have been published. That of Ramsey County is now being published. Your chairman has in his possession sufficient material to last another year or more. Whether material already published has met with approval we have no means of knowing, as but one criticism has been received by your chairman. The committee has expended none of the funds allotted during the past year but your chairman requests that appropriations continue for use when it may become necessary.

J. M. Armstrong, *Chairman.*

COMMITTEE ON INTERPROFESSIONAL RELATIONS

The East Central Medical Society held an interprofessional meeting at Anoka, October 11, with guests representing dentists and pharmacists. Speakers were: Dr. B. J. Branton, representing medical men, Dr. W. A.

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*All committee reports appear in somewhat abbreviated form.

Dickson of Minneapolis, representing dentists, and Mr. Witte of Anoka, representing the pharmacists. No lawyer was present and the meeting was rather small.

On November 3 this committee met with representatives of public health nursing, the Minnesota Hospital Association, pharmacists, dentists and social workers, to discuss the 1939 Conference on Medical Problems. Final plans for this conference were taken over by the general program committee, your chairman sitting in at a number of their meetings.

On February 13, a large dinner meeting of physicians, dentists and lawyers was held at the Athletic Club, in St. Paul. The meeting was instigated by Doctor Branton, fostered by our committee and consummated by the Ramsey County Medical Society. Speakers were Attorney Stanley Houck, of Minneapolis, and Dr. A. W. Adson. There were some 200 present. It is our opinion that meetings of this character should be followed by free discussion though no such discussion was held at this meeting. Your committee believes these meetings are sufficiently valuable to be adopted more generally.

F. J. Savage, *Chairman.*

COMMITTEE ON MILITARY AFFAIRS

The Medical Reserve Corps lacks sufficient funds to train reserve officers in aviation medicine.

Only one applicant in the Seventh Corps Area received active duty training in aviation medicine last year and several others of the grades of captain and first lieutenant passed all requirements but were denied training due to lack of funds.

There are now 675 Medical Department Reserves on active status in the Army and Navy and 585 officers. There has been a decided increase in promotions of officers in the Reserve during the past year.

C. M. T. C. quotas were recruited to the limit of appropriation for training. Coöperation of the profession in examining enrollees has been gratifying.

There are opportunities open for Medical Reserve Officers in the C. C. C. service. Such a service renders an officer efficient in administration and many have successfully passed the medical examination for the army to enter the Medical Corps for their professional career.

The R. O. T. C. situation at the University remains about the same as last year though the untiring efforts of Col. Potts, P.M.S.&T., who has proven to be a very valuable officer, have brought a slight increase. Col. Brackney of Fort Snelling has been detailed as instructor in the medical unit.

A resolution was proposed at a meeting of the committee February 25 for passage by this House of Delegates, asking for more funds for active duty training of Medical Reserve Officers in aviation medicine. It is suggested that a copy of the resolution be forwarded with a letter by each county society to their congressman and senator.

F. L. Smith, Colonel, Medical Reserve,
Chairman.

Doctor Hullsiek: This committee separately considered each report as follows:

Regarding the report of the Committee on Fractures, the reference committee recommends extension of this work throughout the year and succeeding years and recommends that this report and the reports of the Historical Committee, the Interprofessional Relations Committee and the Committee on Military Affairs together with the proposed resolution be accepted.

Dr. F. J. Savage: The discussion on the Wagner Bill that we heard tonight illustrates the fact that we are going to need as many friends as we can get. These interprofessional meetings are a good method of gaining friends. If there are any societies that have held such meetings other than those listed in the report the committee would like to be informed

It was moved, seconded and carried that the report and recommendations of the reference committee be accepted.

The report of the reference committee on Lay Education Reports, of which Dr. J. F. Norman was chairman, covered the following committee reports:*

COMMITTEE ON PUBLIC HEALTH EDUCATION

Public Health Education continues to be the most important organized activity carried on by the medical profession in Minnesota.

Events in Washington and widespread lay discussion of medical care merely emphasize the need for a better general understanding of the fundamentals of health protection and of the progress of medicine.

It is generally agreed by dispassionate commentators on the National Health Program that a large number of the people who receive no medical service during any given year have no need of such service. Another large section of the population undoubtedly stands in need of care but is not sufficiently instructed to seek the needed care. For such people vast new facilities will be of no use. What these people need is education. Physicians in Minnesota saw that need many years ago and have conducted a program of health education steadily and continuously over a long period. Credit for Minnesota's excellent morbidity and mortality rates should go to some extent, certainly, to the systematic effort made by our Association to educate the public in health and hygiene.

It is obvious that this program must be continued and expanded as extensively and effectively as funds will permit. Furthermore, it must be directed toward our own members as well as to the public since the physician, himself, plays an essential role as health educator in his own community.

The new coördinated health program as well as the established services, including the radio program, the newspaper health service, the Speakers Bureau, the college lecture course, the annual 4-H club physical examinations, the distribution of *Hygeia* and *Everybody's Health* to the members of the Legislature and education in first-aid have been continued and in some instances expanded during the past year.

It is the opinion of the committee that they should be continued.

Aid from every member of the Association is needed if the program of the committee is to reach its maximum effectiveness in Minnesota. It is safe to predict that, with such aid, no destructive radicalism in medicine need be feared in Minnesota.

L. R. Critchfield, *Chairman.*

SUB-COMMITTEE ON RADIO

1. Your committee has sponsored a broadcast each week from radio station WCCO. The speaker has been William A. O'Brien, M.D., Associate Professor of Pathology, Preventive Medicine and Public Health.

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*All committee reports appear in somewhat abbreviated form.

This is a continuation of the series which was started April 4, 1928 (now in the twelfth year). Programs are given each Saturday morning at 11:00 o'clock for fifteen minutes.

2. Since October 22, 1928, the program has also been carried by radio station WLB, the University of Minnesota Station, through a special arrangement with station WCCO where the broadcasts orignate. This new arrangement undoubtedly reaches an audience which has not been a regular listening group for WCCO. The University station with its new transmitter enjoys statewide coverage.

3. Since January 1, 1939, your committee has coöperated in the coördinated medical and public health program. During January, a lecture on pneumonia was given. In February, March, April, and May, all the subjects corresponded with the theme for the month; that is, pediatrics, degenerative and circulatory diseases, cancer, obstetrics and gynecology. We will continue to coöperate throughout the year.

4. As in the past, the last Saturday of each month is devoted to a broadcast for the Minnesota State Dental Association. This program is under the direction of the radio committee of that organization. Our speaker is used by that committee for this occasion. Harmonious relations with the dental profession have existed throughout this entire coöperative venture.

5. During the meeting of the Minnesota State Medical Association in Duluth in 1938, your radio committee arranged for a series of broadcasts from the convention. Through the coöperation of the local radio stations it was possible to take speakers to a room in a hotel. Others were taken to the radio stations for their broadcasts. The local committee coöperated in working out the details. (15 broadcasts.)

6. As in the past, abstracts of the radio talks have appeared each month in *Everybody's Health,* the publication of the Minnesota Public Health Association.

7. Letters have been answered by the spokesman. Requests for diagnosis and treatment receive the same reply; that is, it is impossible to diagnose or prescribe by mail. Requests for references to physicians are sent to the local medical societies. Literature is supplied whenever possible and questions not relating to diagnosis and treatment of disease in an individual are answered.

The Committee thanks all who have made this program possible.

Robert M. Burns, *Chairman.*

Doctor Norman: The reference committee considered the reports of the Committee on Public Health Education and the Radio sub-committee as follows:

It would seem that the work in public health education has progressed in a very satisfactory manner during the past year under the leadership of Doctor Critchfield and the chairmen of the different sub-committees.

One of the items discussed by this committee was the publicity given the invitation to lay people to report any lack of medical care. Only a few reports were received and on investigation they were found not to be truly lack of medical care.

We believe the Speakers' Bureau should continue to supply talks on medical and health subjects throughout the state. We advise that local physicians be drafted where a suitable local man can take over the work. This committee suggests and recommends that each local medical society have a member or members who would see to it that a speaker on public health education be supplied for local lay meetings. During the past year offers of talks were made to major women's organizations, including the Federation of Women's Clubs, the Congress of Parents and Teachers and the American Legion Auxiliary. These clubs were glad to avail themselves of the offer. We also recommend the continuance of college lecture courses.

It is felt that *Hygeia* and *Everybody's Health* are valuable aids and distribution should continue. Also, continued coöperation in the 4-H club program is advised.

Your committee approves very decidedly of the newspaper service sent through the Minnesota Editorial Association by Doctor Critchfield. Many rural newspapers have used these syndicated health services and credit should be given to Mr. L. Benshoof of the *Detroit Lakes Record* for his coöperation. It is felt that through our cordial relations with many newspapers throughout the state, such papers might be glad to give publicity to the fact that lectures are available on medical and health subjects through the local medical society.

Your committee believes that Red Cross and First Aid work should be continued. It is believed that the local men who take over this work should be careful that such instruction is complete and definite and should insist on a high standard of efficiency from pupils.

The work of Dr. William A. O'Brien for the Radio Committee has been excellent. The arrangement whereby these broadcasts are heard over WLB as well as WCCO reaches a larger audience. The Radio Committee has covered a wide field and your committee believes that the lectures on pneumonia were very appropriate. The lectures on pediatrics, degenerative diseases, circulatory diseases, cancer, obstetrics and gynecology reach a greater number of lay people than could possibly be reached in any other way. Also, the broacasts which had to do with mental hygiene are a very essential part of lay health education. We feel that letters sent out, on request, to listeners have a very definite value and where literature is available it also should be sent out to individuals seeking information.

Mr. Speaker, we advise adoption of the reports of the Committee on Public Health Education and the Sub-Committee on Radio.

It was moved, seconded and carried that the recommendation of the reference committee be adopted.

The report of the reference committee on Medical Economic Reports, of which Dr. M. C. Piper was chairman, covered the following committee reports.*

COMMITTEE ON MEDICAL ECONOMICS

Since the Committee on Medical Economics was placed in general charge of the recently completed state-wide Survey of Needs and Supply of Medical Care, a brief synopsis of some of the data accumulated may be of interest. While the number of physicians who responded is somewhat disappointing, nevertheless, the net results compare favorably with those obtained in most of the other states.

It is evident that many physicians did not understand the objectives of the Survey. However, as a result of repeated bulletins, letters and meetings and through the personal efforts of Mr. Rosell, many of the county societies responded to the call and turned in creditable reports.

Form No. 1 for physicians was distributed to 1,984 physicians and 739 or 37.2 per cent filled in and returned the forms. Greatest response was from the cities though several rural medical societies such as Red River, Blue Earth, Blue Earth Valley, Wabasha, Watonwan and Washington responded whole-heartedly.

According to data returned, the total number who received free care during the past year was 75,468, the number being in many instances only an estimate. Since this estimate was made by approximately one-third of the physicians of the state, it would be safe to assume that more than 250,000 persons received free care last year. It is of interest that no reports were received either from physicians or from coöperating agencies recording instances of patients who were not able to obtain medical care.

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*All committee reports appear in somewhat abbreviated form.

The great majority of physicians were satisfied in the main with the present system of medical practice though there were many suggestions for its improvement. Only a few were in favor of socialization of medicine and compulsory sickness insurance. There were many expressions of opinion against political influence in the practice of medicine. Some form of voluntary sickness insurance controlled by organized medicine was suggested by several. Criticism was directed toward the inadequate opportunities for hospitalization for the chronic sick. The University Hospital was criticized by several because of over-crowded conditions and an inadequate number of beds to supply the demand. Social workers came in for their share of criticism by several, largely on the grounds of not coöperating properly, and, in some cases, for not taking proper care of their duties in connection with the care of the sick. It was suggested that funds should be made available for health work among school children, particularly for the care of children's teeth. The general current of opinion indicated that all physicians are coöperating to care for low income and indigent cases. A more complete summary of the Survey has been distributed to the delegates.

Many data of value were secured from the other agencies concerned in health work and in care of the sick. Great credit should be given to all who coöperated with us in assembling this information, much of which has never been assembled before and which should be of great economic value.

Largely as a result of government propaganda much interest has been aroused among medical societies in many other states in proposed changes in our present methods of distribution. Popular demand was believed so great by the profession in many states that legislative action might be taken. Spurred by the apparent success of hospital insurance, several state associations are attempting to extend the method to sickness insurance. It is too early to draw any conclusions as to results but it is evident that many difficulties are already arising to hinder the new schemes.

In Minnesota the profession is situated more fortunately than in many other portions of the country. In the main, the people are satisfied with present methods of distribution. Arrangements for adjustment of professional fees and payment of fees by installments have been made in some larger communities such as Hennepin County. Similar plans, together with hospital insurance, would seem to solve the problem to some extent. It would seem wise, in view of the fact that insurance plans in other states are in the experimental stage, to remain for the present in the role of observer. Slow and well considered evolution would seem to be the logical course.

An item of interest in connection with the Survey was the response to the invitation published by newspapers throughout the state to report to the State Office and Mr. Rosell, our Executive Secretary, any instances of persons who were unable to obtain medical care. Some 252 replies were received and analysis showed that most of them came from the indigent or near-indigent group supposed to be cared for by county or state welfare agencies. Many concerned inability to obtain dental care or glasses. Very few were to the effect that physicians had refused care.

With the approval of the Council, members of this committee agreed at a meeting held in January to establish a new sub-committee on sickness insurance. The following committee was accordingly appointed by the Chairman of this committee:

Dr. Edward D. Anderson, Minneapolis, *Chairman;* Dr. W. W. Will, Bertha; Dr. A. W. Adson, Rochester; Dr. O. W. Holcomb, St. Paul; Dr. Gordon C. MacRae, Duluth; Dr. L. A. Buie, Rochester.

The Editorial Sub-Committee with the assistance of Mrs. Fitzgerald has continued in its efforts to arouse interest in the problems of medical economics through the Economics section of MINNESOTA MEDICINE. It would seem to be the duty of every member to read these pages carefully. Contributions from members would be welcome.

W. F. BRAASCH, *Chairman.*

SUB-COMMITTEE ON INDUSTRIAL RELATIONS

Relations between the Industrial Commission, the insurers and physicians have been satisfactory in the main this year though a few reports have come in of refusals on the part of insurers or employers to permit injured employees to be treated by practitioners of their choice.

There is every reason to believe, however, that reasonable fees submitted to the Commission by the physician of the injured workman's choice will be paid.

At the request of several insurance companies, the committee has studied the Wisconsin plan by which the names of all eligible local physicians, including all members of the State Medical Society who wish to participate, shall be posted in industrial establishments.

The committee is not prepared to make any recommendations as to adoption of the plan at this time in Minnesota; but it will welcome any suggestions from members and stands ready to coöperate fully with the Industrial Commission and insurers to provide good care for injured workers.

M. S. HENDERSON, *Chairman.*

MEDICAL ADVISORY COMMITTEE

As chairman of the Medical Advisory Committee it will be my pleasure to make a detailed report verbally to the House of Delegates.

B. J. BRANTON, *Chairman.*

SUB-COMMITTEE ON CONTRACT PRACTICE

During the year 1938-1939 no further instances of apparent irregularities as regards contract practice have been brought to the attention of the committee. All previous recommendations of the committee are reaffirmed at this time.

F. A. OLSON, *Chairman.*

SUB-COMMITTEE ON LOW INCOME AND INDIGENT PROBLEMS

Most of our activities in the year just past have been centered around the question of the Farm Security Administration and governmental agencies related thereto. I have been contacted a number of times by Federal Officials in the hopes that we may set up a Farm Security Medical Administration Program either in the local counties, district Societies or a statewide proposal. However, from experiences coming from North and South Dakota the Committee has proceeded exceedingly slowly in order to learn more definitely the experience of these two states. We contacted the states of Wisconsin, Iowa and Missouri and although the state of Wisconsin has formulated a plan it has not yet gone into effect and in the state of Iowa only three counties in the state have formulated a plan and attempted to put it over and it has only been in operation a matter of a very few months. Opinions heard, but not confirmed, do not speak very well for the operation of the program.

The outline of programs for Wisconsin, Iowa, Minnesota, and North and South Dakota are on file with the Committee, and the Committee respectfully asks that we be allowed more time to formulate the plans if necessary. However, so far there has been no demand from the medical practice as a whole throughout the state, or any locality within the state complaining of financial difficulties with those on the Farm Security Program. We think it is better judgment to wait a while before proceeding on with any definite program and in the meantime we can benefit by the experience of our neighbor states.

W. A. Coventry, *Chairman.*

COMMITTEE ON PROFESSIONAL EDUCATION IN MEDICAL ETHICS AND SOCIAL AND ECONOMIC TRENDS

Following a suggestion made by this committee a year ago a new compulsory lecture program for under-graduates at the Medical School was carried on under the direction of Dean H. S. Diehl at the University this year. Your committee feels that it would be desirable to carry this educational program further in order to reach physicians engaged in active practice. Thus far we have been unable to arrange any plan whereby this might be accomplished. The program is as follows:

Orientation to Practice

1. *Medical Licensure:* State and National Boards; Basic Science Boards; reciprocity; narcotic licenses; responsibilities of licensure; revocation of license to practice medicine.

2. *Opportunities In and Preparation for Practice:* General practice; specialization; industrial medicine; government service; insurance medicine; teaching and research; graduate and post-graduate training.

3. *The Ethics of the Practice of Medicine:* Responsibility of physicians to their patients and to each other; consultations; fee splitting; relationship to druggists; to nurses; birth control; sterilization; abortions; euthanasia.

4. *Quackery, Fads, Cults and Patent Medicines:* Definition and description; reasons for existence; relationship to the practice of medicine and to the public health; attempts at control; borderline types of practice by physicians.

5. *Starting the Practice of Medicine:* Choosing a location; problems of the young practitioner; relationship to other physicians; to hospitals; getting acquainted; determination of fees. Individual and group practice.

6. *The Management of the Public and Private Patient:* Winning the patient's confidence; the diagnosis; the prognosis; coöperation of the patient in carrying out treatment; the patient's family; his job; his bills for medical and hospital care.

7. *Malpractice:* Definition; justified and unjustified malpractice suits; examples; safeguards against malpractice; malpractice insurance.

8. *The Physician in Court:* In industrial compensation cases; as an expert witness in criminal suits; in personal injury suits; in malpractice suits.

9. *Medical Care of the Indigent and of Low Income Groups:* Cost of medical care; system of individualistic practice; free and pay clinics; state medicine; health insurance; hospital insurance; attitude of organized medical profession; trends in this country.

10. *Medical Organizations:* National, state and local; purpose; types of organizations; activities; advantage of membership.

Louis A. Buie, *Chairman.*

EDITING AND PUBLISHING COMMITTEE OF MINNESOTA MEDICINE

The report on Minnesota Medicine for the year 1938 shows an increase in revenue over that for the year previous. There is an increase in advertising revenue and a corresponding increase in the net surplus, in spite of greater costs of publication *due to publishing a larger number of copies and more pages per issue.* The net cash surplus amounts to $934.76 as compared to $623.43 in 1937, an increase of practically fifty per cent.

During 1938 there were printed a total of 36,850 copies, or an average of 3,070 per issue. The total number of pages amounted to 1,224, or an average of 102 per issue. Of this number 890 were devoted to reading matter and 334 to advertising. The reading pages included 130 scientific articles, including those presented in the proceedings of the Minnesota Academy of Medicine and the Minneapolis Surgical Society. In addition there were ten abstracts of papers and twelve case reports. This number does not include the case reports included in the body of many of the scientific articles. Illustrations number 200. That is an average of more than sixteen illustrations per issue, substantially in excess of other similar journals.

Nineteen thirty-eight saw the inauguration of publication of a History of Medicine in Minnesota, in serial form, as prepared by the Historical Committee. A total of 81 pages of historical material appeared in the twelve numbers published in 1938, an average of about seven pages for each issue. This historical material is being retained in type form, which will effect a material economy in the publication of it as a book after its publication in Minnesota Medicine has been completed. The Medical Economics section has been continued with a total of 80 pages devoted to economic subjects. In addition to the scientific articles and special features, the usual sections such as editorials, reports and announcements of societies, news items, book reviews and minutes of the annual meeting were given adequate space.

At the close of 1938 our records showed the total number of paid membership subscriptions to be 2,311 with about 120 subscriptions carried the first part of the year as delinquent accounts. There were 175 nonmember subscriptions. Miscellaneous distribution, including single copy sales, exchanges, complimentary copies, advertisers' checking copies, etc., numbered 314 copies, leaving a surplus of about 150 copies for possible distribution in filling orders for back copies and for sending sample copies to prospective subscribers and advertisers. In this connection we would state that the number of complimentary advertising copies was increased this year at the suggestion of the Coöperative Medical Advertising Bureau, additional copies being sent to the salesmen in this district representing firms advertising in Minnesota Medicine.

During the year, at the suggestion of the Council, quite a thorough check was made concerning publication costs for Minnesota Medicine as compared to similar journals in other states. Printing costs were checked, specifications being supplied to a number of printing firms for a comparison of prices. The committee is glad to report that the present publishing arrangements compared most favorably with similar setups and publishing costs for other medical journals of like character.

We have been fortunate, we think, in holding advertising volume, in fact showing a small increase. As we all know, 1938 brought another business depression, not as severe as the one preceding it, but nevertheless sufficient to cause a still further reduction in the average advertising budget. What can be reasonably expected for 1939, no one can prophesy with any degree of accuracy. Business conditions continue unfavorable, but with some indications of improvement. Unfavorable business conditions have a very important bearing on advertising income. It seems that advertising expenditures are usually first to be reduced in times of stress, and competition becomes keener for every advertising dollar.

So far, the first five months of this year show practically the same volume of display advertising as was carried for the same period in 1938.

Herewith is submitted a statement of cash receipts and disbursements for the year 1938, which is a copy of a report given to the secretary's office early in the year, with remittance in the amount of $934.76.

The committee has considered the desirability of increasing its membership. It was felt that this might possibly be desirable for the purpose of affording greater representation to the membership. Accordingly, the Editing and Publishing Committee desire to recommend to the council this suggestion for consideration, further suggesting that the selection for appointment be made on the following basis, namely: two representatives from Minneapolis, two from St. Paul, one from Rochester, one from Duluth and one member at large from the remainder of the state.

T. A. Peppard, *Secretary.*

STATEMENT OF CASH RECEIPTS AND DISBURSEMENTS

Minnesota Medicine

For the Period January 1, 1938 through December 31, 1938

Source of Cash Receipts			
Display Advertising		$ 9,212.65	
Member Subscriptions		4,621.50	
Non-member Subscriptions		486.70	
Illustrations		5.46	
Reprint Income		6.43	
Dividend		596.16	
Bad Accounts Recovered		41.75	
Gross Cash Receipts		$14,970.55	
Less:			
Discounts and Commissions			
Advertising	$1,377.65		
Subscriptions	13.56		
		1,391.21	
Net Cash Receipts			$13,579.44
Cash Disbursements			
Journal Expense			12,644.68
Cash Surplus for Period			$ 934.76
Accounts Receivable January 1, 1938			$ 1,278.79
Accounts Receivable December 31, 1938			$ 1,099.69

SCHEDULE A

Bad Accounts Recovered

Mudcura Sanitarium	$ 30.60
Palmer Company	11.15
	$41.75

Bad Accounts Charged Off

E-Konomee Oil Burner Co.	$ 28.00
Marshall Manor	145.20
	$173.20

SCHEDULE B

Analysis of Journal Expense

Paper Stock	$ 1,537.99
Printing Expense	5,690.83
(Includes Composition, makeup, lock-up, presswork, bindery work, addressing wrappers and inserting magazines in mailing)	
Editorial Salary—Dr. Drake	1,200.00
Illustrations	557.45
Second class postage and postage used on Minneapolis and foreign copies	358.81
Mailing envelopes	171.85
Bruce Publishing Co. Service Fee	1,680.00
(Covers business management, stenographic service, mechanical editing of all material, ordering all cuts, making up dummy, mailing all proofs, bookkeeping, billing and collecting all accounts, keeping up mailing list, etc.)	
Bruce Publishing Company	132.00
(Covers telephone, telegrams, addressograph plates, etc.)	
Advertising Commission	1,172.89
(Including 5% received from advertising placed through CMAB)	
2% Social Security Tax on labor costs, January through April, 1938	42.31
Stationery Supplies	28.95
1938 Copyright Fee	24.00
A.M.A. Directory	15.00
Insurance Bond—J. R. Bruce, Bus. Mgr.	5.00
Advertising Commission on Drake Hotel	25.20
Electro—Billed to Advertiser	2.40
	$12,644.68

STATEMENT OF INCOME AND EXPENSE AND PROFIT AND LOSS

Minnesota Medicine

For the Period January 1, 1938, through December 31, 1938

Income	ACCRUAL BASIS	
Display Advertising	$ 9,204.35	
Member Subscriptions	4,621.50	
Non-member Subscriptions	468.70	
Illustrations	5.46	
Miscellaneous Income	2.40	
Reprint Income	28.91	
Dividend on Advertising from the American Medical Association	596.16	
Bad Accounts Recovered	41.75	
(See Schedule A)		
		$14,987.23
Expense		
Journal Expense	$12,644.68	
(See Schedule B)		
Discounts and Commissions		
Advertising	1,377.65	
Subscriptions	13.56	
Bad Accounts Charged Off	173.20	
(See Schedule A)		
		14,209.09
Profit for Period		$ 778.14

Dr. M. C. Piper: The reference committee comments on the above reports as follows. The committee assumes that delegates have read all of the reports and this report is therefore short.

Medical Economics. Adoption of this comprehensive report is recommended and a desire expressed that the membership of the Association should not remain in the role of passive observer but should give active support and constructive assistance to the committee.

Industrial Relations. Adoption of the report of this committee is approved and further study of the so-called "Wisconsin Plan" recommended for report at a future meeting.

Medical Advisory. Delegates should listen carefully to Doctor Branton's oral report.

Low Income and Indigent Problems. Adoption recommended.

Contract Practice. Adoption recommended.

Professional Education in Medical Ethics and Economic Trends. Adoption of this report recommended and the desirability of carrying the program further to reach those actively engaged in practice endorsed.

Editing and Publishing. Adoption of this report recommended together with the suggestion of an increase in membership of the committee to provide increased representation.

Doctor Branton was called upon by the Speaker to give his oral report of the work of the Medical Advisory Committee.

Doctor Branton: The work of this committee has to do with dealings between practitioners and with the legal profession and insurance companies. These dealings are necessarily confidential. We have endeavored, however, to assist our members and in so doing have reviewed 35 malpractice cases during 1938 and three during 1939, all with insurance protection. Two others were without insurance protection. A few have shown some neglect on the part of the physician but the great majority have been the result of an endeavor on the part of the patient to recover losses in other fields at the expense of the medical man.

(Further details on these cases were given by Dr. Branton.)

A marked lessening in the amounts of damages obtained of late years shows that the membership is obtaining a better standing before courts and juries.

Interprofessional meetings, two of which have been attended during the past year by the chairman, are heartily endorsed as a means for professional people to come to a better understanding of one another's problems. Twelve editorials based upon problems presented by the cases reviewed have been printed in MINNESOTA MEDICINE during the past year. We hope they have been of interest to the members.

Our recommendation for the coming years is for a closer-knit membership. There are so many big problems to be solved by the profession as a whole that personal ones can well be forgotten. The Golden Rule is still a ractical guide for the practitioner of medicine.

(Further discussion.)

DOCTOR COVENTRY: For your information—there were 7,286 farmers participating in the Farm Security program in Minnesota on September 30, 1938. Of these cases, 1,350 were in the Upper Mississippi Medical Society where farming country is not very good; 659 were in the East Central Minnesota Society and 720 in the Red River Valley Society. We have been persistently besought by Federal officials to arrange a plan which amounts to this: that an insurance plan be set up and that the government should loan the farmer the premium on this insurance. The farmer pays it back when he feels like it. You can imagine when that will be. We have had no requests either from medical societies or from the farmers themselves for such a plan. For that reason we have taken no action as yet. When we do get requests from the farmers themselves—right now they can get medical aid when they need it—then perhaps there will be plenty of time to start on this program.

DOCTOR SAVAGE: Dr. Bayley tells me they had a fine interprofessional meeting in Wabasha and he is willing to tell the delegates about it.

DOCTOR BAYLEY: Nurses, dentists, veterinarians, doctors and their wives atended our Wabasha meeting. Also everyone who was connected with the Welfare Office and the County Commissioners. Each group presented its own problems and then there was general discussion. Some of it was pretty hot but after it was all aired, I'm sure everybody felt much better and the difficulties that appeared so big were smoothed over. Everybody hoped that we would hold another meeting.

It was moved, seconded and carried that the recommendations of the reference committee and the supplementary reports be adopted.

The reference committee on reports of officers and council of which Dr. A. J. Lewis was chairman reported on the following reports:

REPORTS OF CHAIRMAN OF THE COUNCIL

Your councilor can again report a satisfactory activity of the component societies of the first district.

Care of the indigent.—The care of the indigent is coming more and more under local control, and the relationship between County Welfare Boards and the medical profession in most of the counties is improving. There is naturally some complaint with the requirement that permission from a lay board to treat patients must be obtained in advance and that prescriptions are too closely scrutinized.

Syphilis.—The campaign against syphilis is progressing in a satisfactory manner. The State Department of Health Evidently is giving an excellent service.

A.M.A. Survey.—Reports from physicians in the first district, as in other parts of the state, were not as numerous as was originally expected, but I believe a fair sampling has been obtained.

Women's Field Aarmy.—The campaign of the Women's Field Army has been supported by most of our societies but there has been some objection to the apparent desire on the part of the American Society for the Control of Cancer to foster the establishment of clinics. It seems to me that the Society should confine its activities to education of the laity and leave provision for diagnosis and treatment to the medical profession and to established institutions.

The *President's program* for focusing discussion each month to one general topic, combining education of laity and physician as well, has been well received. Much valuable information is being disseminated in this manner. The physician's education of himself should be our primary concern.

There is some demand in the first district for *experimentation with sickness insurance* and a definite demand for *hospital and nursing insurance.* The entrance of commercial companies into these fields is noteworthy.

My report as Chairman of the Council follows:

It is difficult to review concisely the activities of the Council since the last meeting of the House of Delegates. Meetings were held September 10, October 15, December 15 and February 24. The sessions were, as a rule, protracted to give opportunity for free expression of opinion and discussions on topics important to the welfare of medicine and the public. Councilors have given freely of their time at almost no expense to the Association. If I may be allowed to speak impersonally, their interest, loyalty and coöperation are to be commended. I have been impressed, as Chairman, with their harmony, good will and tolerance in spite of differences of opinion. The Council is knit by bonds of true affection and respect.

The Council was called upon to decide on the advisability of moving the offices of the Association to more ample and more centrally located quarters. In order not to interfere with Christmas Seal Work of the Public Health Association temporary quarters were obtained on September 30. The permanent offices, 493 Lowry Bldg., were occupied later and I hope that all of you either have visited or will visit these offices to see what a compact and efficient organization has been provided by the Executive Secretary. Mr. Rosell and Mrs. Fitzgerald, together with Mrs. Holliday, Mrs. Hale and Miss Peterson as whole time associates, have accomplished an enormous amount of routine work, which this year has been increased by the A.M.A. Survey and by the President's monthly educational program.

Under the new arrangement of the budget most of the administrative activities of the various committees are cared for by the permanent staff so that a clearer conception of administrative costs may be obtained. The budgets of various committees are arranged with the understanding that administrative work will, as largely as possible, be done by the whole time staff. All costs associated with the annual meeting and all income from exhibits are grouped together so that an accurate conception of the net cost or profit of the annual meeting may be shown. Every committee chairman and committee member and Mr. Rosell and his staff have responded to the need for economy.

The annual meeting of 1938 showed a slight profit. A very respectable balance over all expenses was shown at the end of 1938 and for the first time in many years it was possible to add to the principal of the Fiscal Agency Account. It must be remembered, however, that this fine showing was partly due to the leave of absence without salary of Dr. Meyerding and his former success in expanding our technical exhibits. On the other hand, without the efficient executive work of Mr. Rosell and his staff no such excellent showing would have been possible. Morever, the Secretary, Dr. Souster, has shown a genuine interest in every phase of the Association's activities and his advice has been of great assistance. It must be noted that this satisfactory financial showing may not be possible in a legislative year like 1939 with additional costs for the President's educational program and the A.M.A. Survey.

The members of the Council individually considered the responses received in answer to the newspaper query "Have you ever been deprived of a doctor's care when you needed it?" Legitimate complaints were very rare.

The Council's attitude with respect to the Minnesota Hospital Association is expressed in the following motion of September 10, 1938, reaffirmed October 15: "It was moved, seconded and carried that the Committee to Study Hospital Service meet with the Minnesota Hospital Association and assure them that the Medical Association is deeply interested and ask that before they initiate any new plan that the proposed plan be submitted to our Committee for consideration." The Council, after frequent and long discussions, has not felt that it should officially endorse the activities of the Hospital Association but, only at their request, act in an advisory capacity. It is needless to say that the Council has been very vitally interested in the activities of the Minnesota Hospital Association.

On December 15 the first distinguished service medal of the Association, authorized by the House of Delegates, was presented to Dr. E. A. Meyerding by Dr. Adson, Chairman of the special committee.

Dr. Hilleboe, Director of the Division of Services for Crippled Children, and Dr. Chesley, Executive Secretary of the State Board of Health, have discussed their plans and activities repeatedly with the Council and their opinions, their coöperation, and good will have been highly appreciated.

Representatives of the Farm Security Administration (including Dr. Meriwether) appeared before the Council and requested coöperation of the State Association in medical rehabilitation of farm clients. A long discussion followed, in order to clarify the situation as much as possible. The matter was referred to the Committee on Low Income and Indigent Problems.

In February the Council approved the request of Dr. Braasch, general chairman of the Committee on Medical Economics, for a sub-committee on Sickness Insurance to study this most important and timely phase of medical care, with the hope that a report could be prepared for the annual meeting of 1939.

Dr. Christison, for many years Chairman of the Editing and Publishing Committee, tendered his resignation in January. The Chairman of the Council endeavored to persuade Dr. Christison to reconsider his decision, but to no avail. The development and the present high standard of MINNESOTA MEDICINE are in a very large measure due to the policies and the persistent efforts of Dr. Christison, and the Association is greatly indebted to him; our appreciation is augmented by our personal affection for him. Dr. Clement of Duluth was appointed as his successor.

The Council, I am sure, would desire me to express its very high regard for the work of Dr. Sogge and his committee and of Mr. Brist. Their efficiency has even exceeded our expectations and our expectations were great.

These are only a few of the more important actions of the Council; for other matters the minutes of the Council meetings may be consulted.

H. Z. Giffin.

REPORT OF THE TREASURER

Finances of the Minnesota State Medical Association as shown in the attached statement of cash receipts and disbursements for the year which ended December 31, 1938, are in good condition.

The year 1937 ended with a deficit of $4,958.00. Operating on the new budget drawn up at the end of 1937 by the Finance Committee of the Council, the year 1938 ended with a surplus of $9,295.56. After the deficit of 1937 had been paid there was still a real surplus of $4,337.39. Of this amount, $4,000 was used by order of the Council to purchase bonds to be added to the permanent investment fund. Thus, for the first time in many years a substantial addition has been made to our fund.

W. H. Condit, *Treasurer.*

MINNESOTA STATE MEDICAL ASSOCIATION STATEMENT OF CASH RECEIPTS AND DISBURSEMENTS FOR THE YEAR ENDED DECEMBER 31, 1938

Current Funds

CASH ON HAND, DECEMBER 31, 1937		
American National Bank, checking account	$ 164.94	
American National Bank, savings account	1,953.51	
American National Bank, exhibit checking account	16.16	
American National Bank, exhibit savings account	1,420.41	
Farmers and Mechanics Bank, savings account	99.45	
First National Bank, savings account	26.82	
		$3,681.29
CASH RECEIPTS, YEAR 1938		
Dues collected, year 1937 and prior	$ 108.75	
Dues collected, year 1938	33,080.75	
Dues collected, year 1939	4,590.00	
Total dues collected	$37,779.50	
Technical exhibit rentals	6,222.88	
Annual banquet tickets	710.00	
Annual meeting luncheons	380.75	
Women's Auxiliary	28.50	
Bruce Publishing Co. (Minn. Medicine)	623.43	
Sale of Diabetes booklets	88.21	
H. M. Johnson Memorial Fund Contributions	87.22	
Interest on savings accounts	133.04	
Postage refunds	4.78	
Reimbursements of 1937 expense	119.94	
Salary advance repayments	300.00	
Sundry items	34.47	
Total receipts		$46,512.72
		$50,194.01
CASH DISBURSEMENTS, YEAR 1938		
Special committees:		
Public policy	$ 5,991.08	
Public Health Education	1,994.56	
Radio	426.34	
Historical	131.50	
Hospital and medical education	28.55	
Medical advisory	33.80	
Medical economics	184.56	
State health relations	24.57	
Survey—medical care	174.21	
Unbudgeted committees	196.80	
Conferences and meetings:		
Annual meeting	5,907.64	
Council expense	229.79	
A.M.A. delegates	331.45	
County officers' meeting	398.11	
Other conference expense	133.23	
Diabetes booklets	3.40	
Dues refunded	2.00	
President's contingent fund	112.18	
Accrued 1937 expense	561.17	
Membership	199.10	
Furniture and fixtures	987.95	
Minnesota Medicine	4,665.60	
Note payable repaid	1,000.00	
Salary advance	200.00	
Transfer to Memorial Fund savings account	2,014.64	

Administrative:		
Executive secretary's salary	3,600.00	
Executive secretary's travel expense	1,331.99	
Office salaries	4,500.00	
Office supplies	495.84	
Postage	465.91	
Telephone and telegraph	445.70	
Rent	899.18	
Audit, insurance and miscellaneous	298.41	
Extra clerical help	295.25	
Periodicals	67.08	
Treasurer's salary	100.00	
Secretary's salary	50.00	
Secretary's expense	31.69	
Moving expense	62.58	
		$38,575.86

CASH ON HAND, DECEMBER 31, 1938		
American National Bank, checking account	$ 3,692.97	
American National Bank, savings account	26.28	
American National Bank, exhibit checking account	493.87	
American National Bank, exhibit savings account	2,264.78	
Farmers and Mechanics Bank, savings account	5,075.32	
First National Bank, savings account	64.93	
Total Cash on Hand		$11,618.15

REPORT OF THE SECRETARY

A period of unexampled activity has marked the year 1938-39 in the State Office of the Minnesota State Medical Association.

The effort of the Council and committees of the association to meet the challenge of activity in Washington and of social and economic needs in Minnesota is closely reflected in the program carried on by the association this year.

That the program must steadily progress and expand seems clear if Organized Medicine is to assume its proper responsibility and maintain its proper leadership in public health education, in public protection, in the administration of medical care for recipients of relief and social security aids and in the development of medical services in Minnesota.

Office Removal

Removal of the headquarters of the Minnesota State Medical Association to the new offices, at 493 Lowry Medical Arts Building, St. Paul, was accompished by November 1 of last year. The offices had been remodeled previously to the special uses of the association, and the loop location close to banks and post office has added greatly to the efficiency of the office without increasing budget expenditures. The new offices provide a conference room that has been much used during the past six months, particularly by Dr. L. L. Sogge, Mr. F. Manley Brist and the Committee on Public Policy, and this close contact has aided the state office and the committee to work closely on all matters relating to the public relations of the association.

Coördinated Program

The largest single new activity added to the program this year has been the Co-Ordinated Medical and Public Health Program which was first suggested as a means of aiding county societies in their regular scientific programs and which has developed, under the guidance of committee chairmen and particularly of the Committee on Medical Education and Hospitals, into an important state-wide public health program, following a regular monthly schedule and carried on by means of newspapers, radio and lecturers. The most popular feature of the program, so far as the membership is concerned, has been the monthly packet available upon request from the State Office. This packet has contained, from time to time, information of especial scientific interest. In the main, however, it has provided the latest morbidity and mortality studies from the State Department of Health and late information couched in simple terms and designed to aid the physician in his own health educational work among his patients and before public groups in his community. The asssistance of the Minnesota Department of Health, especially of Dr. A. J. Chesley and his staff, has been invaluable in the preparation of material for these packets. Assistance of the Women's Field Army Against Cancer, of which Mrs. Harlow Hanson is state commander, also of the Metropolitan Life Insurance Company, is gratefully acknowledged. A complete report of the packets mailed, speakers booked and of publicity accorded the program in Minnesota newspapers is contained in the Report of the Committee on Hospitals and Medical Education, of which Dr. J B. Carey of Minneapolis is chairman and under whose general supervision the program has been carried on.

Speakers Booked

The willingness of the State Medical Association to provide speakers on the subject of the month or on other subjects was announced to Federation of Women's Clubs and other organizations and in the newspapers. As a result, the state office has been called upon to supply speakers for a large number of talks before luncheon clubs, women's organizations, parent teacher associations this year. In many cases these talks were given on the subject of the month. Many others were requested on socialized medicine and, in all cases, every effort has been made to supply an effective and well qualified speaker regardless of subject. A large number of these talks were booked in addition to the regular college lecture courses arranged by the association.

The acute public interest in medicine and medical services and the great need for qualified speakers to discuss the point of view of organized medicine toward the National Health Program, compulsory sickness insurance and the social and economic relations of medicine prompted arrangement of a Forum on Medical Care at the St. Paul Hotel, January 14. More than 200 members from all over the state paid their own expenses to attend this meeting. Mr. J. G. Crownhart, secretary of the Wisconsin State Medical Society, reported on his personal study of medical services in Europe. Dr. B. A. Dyer of Sioux Falls, South Dakota, discussed the medical services instituted by the Farm Security Administration in South Dakota. As guest speakers, Dr. George Earl, Dr. C. B. Wright and Dr. W. A. O'Brien and others contributed to the discussions.

Special Officers' Meeting

Earlier in the fall, a special meeting of county officers and delegates was called to determine the policy of the Minnesota State Medical Association toward the National Health Program. The policy adopted at that meeting was presented by American Medical Association delegates at a special meeting of the House of Delegates in Chicago, September 18. It is worthy of note that the principles adopted in Minnesota formed the basis for the action taken in Chicago.

News Letter

The regular News Letter from the State Office, sent formerly only to state officers, committee chairmen and officers of county societies, has been sent to all members of the association by order of the Council this year. The News Letter is a single sheet made up in newspaper form and supplying the membership with current organization news briefs. Accompanying it each month is the special bulletin on the subject of the month and the packet available upon application to members. The value of this regular direct link between the association headquarters and the members has shown itself clearly during the last six months by the quick and enthusiastic response of the members.

The established health education services of the association have been carried on this year, including the College Lecture Course now handled by the Minnesota State Medical Association alone, on a basis of two lectures for each college during the school year; the Newspaper Service designed especially for the use of rural newspapers and sent weekly to 500 papers through the Minnesota Editorial Association; membership; building and maintenance of biographic and membership files for which new fireproof files have been provided and arrangements for committee and county officers' meetings.

Consideration is being given to a suggestion made by editors to convert the regular news service to a question and answer column in the future.

The Survey of Needs and Supply of Medical Services carried on by the state association in connection with the national survey of the American Medical Association was undertaken last fall and completed in March. Questionnaires were sent to all physicians, to social workers, nurses, hospital administrators, educators, pharmacists through their organizations. Results were tabulated for each county and copies of these tabulations went to county society secretaries and to the American Medical Association. A general summary for the state is reported upon by Dr W F Braasch, chairman of the Committee on Medical Economics, under whose sponsorship and direction the survey was carried on.

Relief and Social Security

The position of the physician in the administration of relief and social security aids is now well defined in the law as a result of clarification secured in the relief laws passed by the last session of the legislature.

Following more than a year of experience under the "choice-of-vendor" clause of the laws of 1937 and of close coöperation between the state medical association officials and the state relief administration, representatives of the relief administration, themselves, asked for the new clarifying phrase which ends any difference of opinion as to applicability of choice of vendor to the services of the physician. The law now provides choice of vendor for services and supplies to the recipient of relief. There can be no doubt as to the right of the relief patient to his choice of physician in counties that accept state aid outside of the large cities.

The close and friendly contact between the association and all state agencies has been maintained and cemented during the past year. Virtually no new programs, appointments or cancellations involving medicine are made without advance consultation with the state office. Relations between the association and all divisions of the State Department of Health have been particularly gratifying and harmonious this year and call for the grateful appreciation of every physician for the scrupulous care manifested by Dr. A. J. Chesley and his staff to secure approval of responsible heads of the association at every step in their program. It is safe to say that whatever new appropriations and programs may be initiated in Washington, physicians in Minnesota will be given the opportunity to pass upon their need for them and the form they may take before they are instituted in Minnesota.

Physicians in Minnesota share, obviously, in the results of current threats against Organized Medicine in general and against the American system and standards of practice. In their own state, however, they are held in trust and respect. Furthermore, the system of private medicine working closely with the official agencies in the handling of public charges, is probably more firmly intrenched in this state than ever before.

The future policy of the state medical association in Minnesota undoubtedly lies in the development of this system and the present program rather than in doubtful and expensive experimentation that may well operate, in the end, to disturb favorable morbidity and mortality rates and to lower standards of medical care in the state.

B. B. Souster, *Secretary*
R. R. Rosell, *Executive Secretary.*

REPORT OF THE COUNCILOR OF THE SECOND DISTRICT

The second district is composed of nine counties in Southwestern Minnesota and is organized into three medical societies. One society covers six counties, one two, and the other one county.

There are one hundred and seven members of the state association in the second district and nearly everyone paid dues for 1939. I do not know of any doctor in the district that is entitled to belong that is not a member.

Nearly every county has a Medical Club for study of medical and social problems. Many have written their Congressmen and Senators about the pending Wagner Bill and have received very encouraging replies.

Each society has held several scientific meetings and the Southwestern Minnesota Medical Society had a Post-Graduate Course in 1938 with very good attendance.

A great number from the district are regular attendants at the State meeting and also at the meetings of the Southern Minnesota Medical Association.

L. L. Sogge.

REPORT OF THE COUNCILOR OF THE THIRD DISTRICT

Our members have been most active in every phase of medical work in this district. Meetings have been well attended and discussions with regard to the various phases of medical practice have been most enthusiastic. It seems to me there has been a marked gain in the pleasant relationships between the members of organized medicine which argues well for the future in this district.

There has been, however, one discordant note throughout the district and that is in regard to the care of the so-called indigent, and considerable criticism of the relief set-ups in the various counties. Attemps to iron out these difficulties have not met with great success up to the present time, owing to the fact that there has been so many changes in the methods employed, as well as the amount of money available and appropriated for medical care.

The members all feel that a still further coördination of the various phases of relief are most necessary, and that the contact committee should have a very close contact with the relief offices and much more to say about the distribution or allotments for medical care.

B. J. Branton.

REPORT OF THE COUNCILOR OF THE FOURTH DISTRICT

The condition of the Fourth District has been very satisfactory during the past year. There have been no serious problems, and everyone is working in harmony. The physicians from my district are willing to cooperate with the rest in helping overcome the tendency toward State Medicine.

J. S. Holbrook.

REPORT OF THE COUNCILOR OF THE FIFTH DISTRICT

In response to a newspaper story asking for information concerning any failures to receive adequate medical care in Minnesota that was sent out under the Public Health Education Committee of the Minnesota State Medical Association, there were several letters sent in from the Fifth District. The copies of these letters were forwarded to me and I contacted the secretaries of the various societies that we might investigate these complaints. I wish to report that the coöperation from the various secretaries was excellent, and all the complaints were investigated.

There has been some difficulty in the matter of two physicians who made application for membership in the East Central Minnesota Medical Society. I consulted with these men and also some members of the County Society. After this conference, I advised these two applicants to again confer with the committee of the society and to advise them that they are very willing to follow the rules and regulations of the East Central Minnesota Medical Society. I also told them to make another application for membership, and I trust that this matter will be satisfactorily adjudicated.

It has appeared, also, that the Dakota County Medical Society is not functioning satisfactorily. On April 27th, 1939, a meeting was held which was attended by Dr. George Earl, Dr. B. B. Souster, Dr. H. R. Tregilgas, Mr. R. R. Rosell, and myself. It was decided that a meeting of the Dakota County Medical Society should be called and this meeting to be attended by Dr. Souster, Mr. Rosell, and myself. The importance of a sound organization will be emphasized and I am sure a satisfactory organization will be maintained.

E. M. Jones.

REPORT OF THE COUNCILOR OF THE SIXTH DISTRICT

The letters which were sent to the State Association from this district, in response to the notice published in local newspapers, were investigated and practically no cases were found who needed medical care and were unable to obtain it.

A special committee of the Hennepin County Medical Society is studying insurance plans to cover the cost of medical care. They are making progress but have not formulated any definite plan. It is encouraging that interest in these matters is becoming manifest.

I am also pleased to report that the membership in our Society is slightly in excess of that for the same period last year.

C. A. Stewart.

REPORT OF THE COUNCILOR OF THE SEVENTH DISTRICT

In the Seventh Councilor District during the past year, two significant developments have occurred. First, only 80 requests for aid involving 344 persons were received from this district in response to the press release of the Association's Economic Committee. This district is composed of 11 counties, many of which are among the state's poorest financially, and the population of the district is 250,000. The vast majority of the replies requested dental and optical and not medical relief, and also portrayed not mal-distribution of physicians and lack or inadequacy of medical care but ineffective distribution of state or federal relief benefits. Even though the entire 344 had received inadequate medical care, it would indicate that only 0.13 per cent of the people in some of Minnesota's poorest counties received inadequate medical care, rather than 33⅓ per cent as stated by some of the propagandists opposed to the present system of medicine.

Secondly, some of the effects of the extension of the activities of the Minnesota Hospital Service Association into this and neighboring rural Councilor Districts have become apparent. Following publicity that a certain hospital had become a member of the Hospital Association, one of the commercial insurance companies started a hospital insurance sales campaign in the district. During the sales campaign, which extended into competitive hospital territory, at least one and possibly more purchasers gained the impression that hospitalization was possible not in any hospital but only in the hospital mentioned in the newspaper item. This experience served only to emphasize the opinion of the Association's Hospital Committee that free choice of hospitals as well as free choice of physicians is imperative in extension of the activities of the Hospital Service Association to other areas than Minneapolis, St. Paul and Duluth.

These experiences and growing concern about the trends of medical economics have increased attendance of medical meetings and have resulted in greater cohesion of members of the profession in this district, both of which elements reflect the importance of membership in and the safeguarding influences of the Minnesota State Medical Association.

Edwin J. Simons.

REPORT OF THE COUNCILOR OF THE EIGHTH DISTRICT

Conditions in the Eighth District are as satisfactory as can be expected under existing paternalistic conditions.

There is an increasing spirit of coöperation between the doctors. Practically all practicing physicians eligible to membership belong to one of the societies or are on the waiting list.

The officers and members of all the societies, Clay-Becker, Park Region and Red River Valley deserve commendation for the high scientific standards maintained and large attendance at their meetings.

W. L. Burnap.

REPORT OF THE COUNCILOR OF THE NINTH DISTRICT

The Ninth District has had quite smooth sailing during the past year. The meetings of the St. Louis County Society at Duluth have been well attended and attractive programs provided. The meetings of the Range Medical Society, which is a branch of the County Society, have been better attended this year than in the past, and the programs have been varied and comprehensive.

The replies to the inquiry sent out by the Council in some of the farm magazines have been rather interesting. We have had quite a number of replies from our district. And while none of them are of a serious nature and some had been taken care of before my first letter went out to the writers, one cannot help but wonder from the letters sent in whether the independent self-sustaining American spirit of the earlier pioneers is giving way to a more subservient feeling on the part of these settlers in the newer districts of our Northern country and that they are being imbued with the new deal spirit that the Government owes them a living. In practically every instance, my impression was that these people are getting along far better and far more comfortably than the pioneers in any previous period of our country's history; and particularly from a medical viewpoint. I think never before have these outlying settlements had good medical services as easily accessible and as close to their homes as they have at the present time; and no instance has been cited where doctors have refused to attend patients for lack of funds.

There have been a few suggestions that the Range Medical Society should break away from its parent organization, the St. Louis County Society, and become a sepearate organization. I do not believe this is the general feeling of the doctors on the Range, and I do not believe this would be a wise step to take. With the threats of socialized medicine, with the Wagner bill introduced into Congress, with such bills as the Richburg bill introduced in the New York State Legislature, the Medical Profession should concentrate in strong groups rather than be divided into small ones, for we may need every possible strength to combat the tendency toward Government control of medicine.

Bertram S. Adam.

Doctor Lewis: The reference committee makes the following recommendations on reports of the officers:

Treasurer's Report. It was the belief of the reference committee that the report of the Treasurer was the most encouraging we have had for a number of years. It was most gratifying that, not only was the budget balanced, but there was a surplus at the end of the year. This has been accomplished without actually cutting down on the activities of the association.

Secretary's Report. It was agreed that the Secretary should be complimented on the excellent work he has carried out in the past year. His report shows much activity along progressive lines. This is in spite of the fact that this is his first year and many of the activities must be new to him.

Reports of Councilors. It was recommended that the reports of Councilors of the First, Second, Third, Fourth, Fifth, Sixth, Seventh, Eighth and Ninth Districts be accepted.

The report of the Chairman of the Council indicates that the work of the Council has been very harmonious and of great value to the association.

It was moved, seconded and carried that the recommendations of the reference committee be adopted.

The reference committee, of which Dr. W. A. Stafne was chairman, reported on the following reports.*

COMMITTEE ON UNIVERSITY RELATIONS

Your Committee met with Drs. Diehl, Boynton, O'Brien and Mr. Amberg of the University.

Various complaints and suggestions of practicing physicians throughout the state were discussed with these University heads of departments. These various heads presented their problems in their attempts to do justice to their work at the University and at the same time do justice to the profession throughout the state.

Dean Diehl told the committee of the efforts made to improve the faculty and the medical school in general. He also told the committee of the advanced standards of admission to the medical school. He outlined the new course now given the senior medical students in medical economics. Mr. Amberg explained his policy in admitting patients to the University hospital. He stated that their policy was to keep down the number of pay patients to a minimum. They aim to admit few other patients than are necessary for teaching purposes.

Dr. Boynton stated that their policy in the University Health Service was to handle prophylactic and minor ailments of all regular students and major ailments only of those not financially able to pay.

Dr. O'Brien outlined his work at the Continuation Center. He explained the work they are giving the practicing physicians; where these physicians are coming from; and the increasing interest in this course.

These various heads of the medical departments agreed to give the economic section of Minnesota Medicine an outline of the work of their various departments that the physicians throughout the state may keep posted on their various policies.

J. M. Hayes.

COMMITTEE ON STATE HEALTH RELATIONS

The Committee on State Health Relations has continued its active coöperation with the State Board of Health and other state agencies.

The work with the State Department of the American Legion in regard to periodic examinations of Legionnaires (reported as under consideration at the time of our last report) has progressed further to this extent: tentative blanks which we worked out were taken by the chairman to the Legion Convention at St. Cloud last summer and considered in a conference with their Rehabilitation Committee. After extensive discussion, Dr. Williams of Slayton, of the Rehabilitation Committee, was added to their subcommittee to study the matter, and it was referred to them for further study. There was some discussion of it in the pages of the Minnesota Legionnaire still later but I have not heard that anything definite has been decided as yet.

Theodore H. Sweetser.

COMMITTEE ON PUBLIC POLICY

(Oral report given direct to the Reference Committee by Dr. L. L. Sogge, chairman)

Doctor Stafne: The reference committee recommends acceptance of the report of the Committee on University Relations. The Committee feels that the new course now given Senior Medical students in medical economics is a definite step forward and recommends its continuance. The Committee is also in accord with the desirability of carrying this educational program further in order that it may reach those who are actively engaged in practice, as suggested by the sub-committee on Medical Education and Social and Economic Trends.

Dr. Sogge, chairman of the Committee on Public Policy, gave a detailed report of the work of his committee. The reference committee felt that this committee should be highly commended for the tireless and efficient work which it has done. This committee recommends that Dr. Sogge be permitted at this time to give his report to the House of Delegates and further recommends acceptance of the report.

The Speaker called upon Dr. Sogge for his report. At Dr. Sogge's request no notes were taken of this report.

(The report of the Committee on State Health Relations was transmitted late and consequently no official action was taken on it.)

It was moved, seconded and carried that the recommendations of the reference committee be adopted.

Doctor Hayes: Mr. Speaker, there is just one thing in connection with this University Relations report that I should like to say. One of our delegates came before the Council this afternoon with some complaints which seemed so important that the Council has asked him to appear tomorrow morning with the Council, the Dean of the Medical School and the Superintendent of the University Hospital. The Delegates may hear more about it later.

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*All committee reports appear in somewhat abbreviated form.

Doctor Will: We are ready now for the report of Dr. A. J. Chesley, executive officer of the State Board of Health.

Doctor Chesley: The Board asked $380,000 this year from the legislature, $104,000 more than last year. We received a cut in every item except one and a total of $34,313 less than last year. If it had not been for Dr. Sogge and Mr. Brist who sat with the committee all night on the matter, the Biologic appropriation would have been cut. Instead of that one appropriation was raised from $3,000 to $4,000.

The cuts put us in an embarrassing situation and the Board desires an expression of opinion on several matters, particularly on the pneumonia program. Last year we had a balance from our Biologics fund due to low prevalence of diphtheria, plus some Social Security Funds, to supply free pneumonia serum and finance our 24-hour typing service. This year we asked for $20,000 to carry on the work and were granted nothing.

We believe from reports we've had that the physicians approve of the program and would like to see it continued at least until you know whether you can substitute a drug for the serums with as good results or whether you need both. Apparently from opinions expressed by those who are doing the work the time has hardly come when you can abandon serums.

During the past year there have been 1,834 specimens typed in our laboratory involving 3,617 tests. The year before there were 664 specimens and 1,280 tests. Typing was successful in 64 per cent of specimens in 1938. The number of stations increased from 57 in 1937 to 86 in 1938. We have continued examining specimens for T.B. and found 20 cases that were previously unrecognized. The preponderance of serum distributed is in types I and II. If we are able in any way to get some money to carry on this program should we restrict our serum to those for types I and II during the coming year or should we try to carry the whole 37 types that are available? We have to adapt our methods to what you want with the means we have.

As you know the venereal disease allotment to the Public Health service has increased and the allotment to Minnesota is $72,379 but we have to match $50,818 to get any of it. Our state venereal disease appropriation was cut from $24,000 to $20,000 but fortunately we are permitted to include in our matching funds any increases in local services and so we may be able to make up the requirements.

The question arises as to how we should use the money. We should prefer to have the money without strings since in Minnesota, with 2,000 deaths each year from pneumonia, I believe we need it more for pneumonia than for venereal disease.

You may be interested in our Influenza Research Program, which we are conducting in coöperation with the Rockefeller Foundation of three strains of the virus—the Porto Rico, the Philadelphia and Shope strain of swine origin. They are being carried through animal passage and established in tissue cultures. We haven't had a true influenza epidemic unless you include this latest outbreak. If one should occur the material developed here would be checked with the New York laboratories of the Institute in the hope that we could arrive at some basic means of control. Dr. Thomas Francis, Jr., who is on your program this week, has been in charge of the Rockefeller program in influenza research.

We have seen a lot in the papers about the presence or absence of rabies. For six years, '32 to '38, we had no rabies reported in the lower animels. In '38 we had 138 cases from 24 districts and 9 counties. In 12 cases, the diagnosis was proven by laboratory diagnosis; 18 were diagnosed on clinical grounds. There were 225 persons reported to have received anti-rabic treatment.

Encephalitis research has been conducted in coöperation with the National Institute of Health and the Animal Pathology Division of the Rockefeller Institute, making neutralization tests on blood from cases and convalescents; we had reports on 19 cases. On 9 of them we have made neutralization reports. Eight were on the western strain of the equine encephalomyelitis and one of the St. Louis type of human encephalitis. The question of the spread through certain types of mosquitoes has been investigated quite thoroughly but there is difficulty and confusion in diagnosis of the different types.

The increase in laboratory work has been considerable. In our main branch we did 433,204 examinations in 1938, an average of 388 a day and an increase of 11 per cent over 1937. Figures do not indicate the amount of work connected with these examinations.

In venereal diseases the cases are about as usual with 322 cases of syphilis and about 2,300 gonorrhea reported. The usual follow-up work, furnishing of free drugs, termination of sources of infection, securing treatment of exposed persons, reference of other cases to proper sources of treatment and investigation have been carried on. We hope to do a little better job along these lines than we have done in the past with this Federal money. Unfortunately, the Public Health Service seems to think we are doing too much work in our central laboratories and in our follow-up. We have gone over our program very carefully with your committee and others, and we feel that our method is right for Minnesota. Now, of course, after you take the King's shilling perhaps you're going to be led around where they want you to go. So far we've been able to keep a pretty even balance, however, and with three Irish and a Scotsman in our division we are going to be hard to kick around.

In the division of Preventable Diseases, and also in Vital Statistics and in Sanitation there has been an immense increase in work without any extra appropriation, due to the Social Security Act. Much information and service that couldn't be delivered otherwise is required by the Federal authorities.

As to the Division of Child Hygiene, Dr. Hartley has been particularly pleased with the coöperation of the University staff and members of the association who have sponsored the postgraduate courses. We have just finished the third year of these courses. The question has arisen as to whether we should continue the present type of postgraduate session or finance study at the Continuation Center for people from various parts of the state. That is probably what we shall do eventually. The question is: are more people who are doing obstetrics busy men who would not be reached if they had to give up a week to courses at the Center?

The Board desires during this session to get a very definite opinion through the delegates and Council on what you think is the right thing to do with the limited funds we have to spend this year.

Doctor Coventry: Before Doctor Chesley's report is voted on I'd like to offer an amendment to the motion to the effect that we thoroughly appreciate the attitude of the State Board of Health and Doctor Chesley's coöperation with the State Medical Association.

It was moved, seconded and carried that Doctor Chesley's report be accepted with the amendment as stated by Doctor Coventry.

Doctor Sweetser: Mr. President, I think the State Board of Health ought to be commended on their spirit of independence in spite of attempts at outside regulation.

Doctor Will: May we have the report of the State Board of Medical Examiners by Dr. J. F. DuBois?

Doctor DuBois: The Board of Medical Examiners is interested, first, in seeing that only those qualified to practice healing are allowed to practice in Minnesota. Second, that those licensed to practice conform to the highest ethical standards and that those who practice in violation of the laws of the state are punished according to the rules and regulations set up for us by law.

The annual registration is undoubtedly of the greatest value to the Board in carrying out its work. First it makes the Board independent. Second, it gives us a list of all who are qualified to practice the healing art in Minnesota each year and where they are. In many states, men have been dead for years but their licenses to practice go merrily on. They are stolen, often by crooks, or used falsely to issue precriptions.

There are certain problems in the work of the Board which I should particularly like to take up with you. One concerns internship. The term is vague and often it is used as a subterfuge to permit physicians who have not qualified here to take a postgraduate course and practice medicine in Minnesota. At graduation the physician gets only an M. B. His internship is part of his education and a pre-requisite to get his M. D. It should not be possible for a man who has already served an internship elsewhere to serve a second in Minnesota.

Another concerns liquor prescriptions. Certain parts of Minnesota are dry and apparently some of the doctors there are broke. In any case, some of them have sold their prescriptions to drug stores at five cents apiece. Fortunately we have had very good relations with the liquor control board. They have informed us where there is trouble and allowed us to settle the matter wherever we can find the guilty doctors.

In handling narcotic cases, especially, where doctors have become addicts, we have tried to rehabilitate the doctor and not to be too drastic. Prior to two years ago we could only reprimand or revoke a license. Now we can also suspend for a period which is a very fine addition to the law. And incidentally the Basic Science law under which we operate is one of the great laws of Minnesota. I know of no law that has been of more benefit to the public.

In this connection, I want to say something to those of you who become impatient after you have reported some infraction of the law because the Board is unable to make an immediate investigation. We take cases as rapidly as we can and in the order of their importance. Remember: we have only one attorney. He is also attorney for the Association and if there is a busier attorney in the state I don't know where you'll find him. Most of the time we have fifty cases ahead of us and we try to group the cases in various parts of the state for the sake of efficiency.

In the past year we have had seventeen court cases and thirteen convictions. One jumped bail, one died before going to trial, two were found not guilty. There were fifty investigations, four revocations of licenses, eight suspensions of licenses.

During the entire history of the Board, sixteen chiropractors and forty-three osteopaths have been admitted to practice by examinations. In 1928, 2,402 doctors registered in Minnesota, 162 osteopaths, 493 chiropractors, 111 midwives and 252 masseurs. In 1939, we had 4,009 doctors—a few of whom keep up their registration though they are out of the state, 159 osteopaths, 395 chiropractors, 57 midwives and 148 masseurs.

You may ask how sixteen chiropractors could pass the examinations. We understand that the chiropractic schools are now giving quiz courses in Basic Science in which they coach on questions from all the various states by way of priming their students.

Now, I should like to take up the foreign question. Our resolution on this matter requires citizenship, first. Second, it requires proof of attendance in a class "A" school recognized by the Board. Graduation and a degree is required. Third, all credentials from foreign schools and institutions must be translated into the English language over the signature and seal of the American consul of the country wherein the documents were issued. Fourth, the candidate must present evidence satisfactory to the Board of good moral character. Fifth, he must present satisfactory evidence to the Board that he holds a valid license to practice medicine and surgery in the country where his medical education and degree were obtained. Sixth, he must present evidence satisfactory to the Board that a medical licentiate with the Seal of Minnesota is granted reciprocal privileges in that country. Seventh, he must have a Minnesota certificate of registration in the Basic Sciences. The Board passes on all applicants individually.

We hope all doctors in teaching positions and all who hope to assist foreigners to secure licenses to practice here will carefully read these regulations. We feel that it is unfair to the people of the State of Minnesota to maintain a University by taxation and then to accept foreigners for license when their own graduates are denied licenses in Europe.

Following is a comparison between what has happened in New York and in Minnesota. From 1930 to 1938 New York licensed 4,390 graduates from New York schools, 3,250 from other schools in the United States and 2,907 foreigners. In Minnesota from 1924 to 1939—seven more years—we have licensed 2,478 from the United States or Canadian schools which we have put practically on the same basis as United States schools and thirty-five foreigners. Since the passage of this resolution we have taken in four foreigners who had their credentials in for consideration before its passage. The American Medical Association was of the opinion, incidentally, that we could not enforce citizenship. We have enforced it and are willing to go to bat on it. Fifteen states have adopted citizenship and four more have bills pending. In that connection, I want to mention that we are fortunate in our legal advice. Many times we have asked Mr. Brist for an opinion. He has given it to us and asked us at the same time to get an opinion from the Attorney General. Without exception, since 1927, the Attorney General has substantiated Mr. Brist's opinions.

Doctor Will: Doctor Roholt of Waverly requests the privilege of presenting a resolution from Wright County.

Doctor Roholt: Wright County Medical Society has gone on record favoring some legislation to be authorized by the State Medical Association requesting that the state pay one-half of the hospital expenses of indigent individuals in private hospitals throughout the state, the other half to be paid by the local county welfare board with the exception of localities where either the city or county maintains already existing hospitals. We feel that this would tend to decrease taxes, help local hospitals, relieve the University Hospital of cases of no value for teaching purposes, retain the free choice of physician and give the patient a chance to remain at home.

Dr. W. A. Coventry: I move, Mr. Speaker, that this matter be referred to the Committee on University Relations, for study and possible referral to the Committee on Public Policy.

The motion was seconded and carried.

Doctor Will: The report on Necrology by Doctor Gilbert Cottam.

Doctor Cottam: This report is from the Historical Committee and deals with the deaths of the following members during the past year:

Members

Andrew S. Backus, St. Paul, Born 1881. Univ. of Toronto, 1905. Died January 20, 1939. Aged 58.

Martin C. Bergheim, Hawley, Born 1886. Univ. of Minnesota, 1919. Died October 14, 1938. Aged 52.

Henry M. Bracken, Claremont, Calif., Born 1854. College of Physicians and Surgeons, New York, 1879. Died September 25, 1938. Aged 84.

Chester M. Carlaw, Minneapolis, Born 1865. McGill University, 1891. Died January 7, 1939. Aged 73.

Leo M. Crafts, Minneapolis, Born 1863. Harvard University, 1890. Died September 22, 1938. Aged 75.

John Folta, Ceylon, Born 1901. University of Minnesota, 1928. Died October 14, 1938. Aged 37.

Henry H. Helk, Minneapolis, Born 1879. Minneapolis College of Physicians & Surgeons, 1902. Died March 23, 1939. Aged 59.

Arthur Kahala, Crookston, Born 1877. Minneapolis College of Physicians & Surgeons, 1902. Died November 19, 1938. Aged 61.

Carlos R. Keyes, Duluth, Born 1856. University of Vermont, 1881. Died August 10, 1938. Aged 82.

Thomas Lowe, Pipestone, Born 1858. Hahnemann Medical College of Chicago, 1885. Died March 8, 1939. Aged 80.

Irving C. MacDonald, Minneapolis, Born 1874. Univ. of Minnesota Medical School, 1902. Died December 5, 1938. Aged 64.

Charles H. Mayo, Rochester, Born 1865. Northwestern University. 1888. Died May 26, 1939. Aged 74.

Harold F. Neilson, Minneapolis, Born 1904. University of Minn., 1930. Died May 23, 1939. Aged 35.

L. K. Onsgard, Sr., Houston, Born 1866. Eclectic, Cincinnati, 1887. Died October 24, 1938. Aged 72.

Albert H. Parks, Minneapolis, Born 1880. Northwestern Univ., 1906. Died August 30, 1938. Aged 58.

William P. Ross, Battle Lake, Born 1893. Univ. of Manitoba, 1923. Died June 25, 1938. Aged 45.

Jerome F. Smersh, Owatonna, Born 1892. University of Minn., 1917. Died October 26, 1938. Aged 46.

Frederick A. Stevens, Lake Elmo, Born 1860. Hahnemann Medical College of Chicago, 1883. Died November 30, 1938. Aged 78.

Herbert H. Thompson, Minneapolis, Born 1883. Jefferson College of Philadelphia, 1909. Died May 22, 1939. Aged 56.

John A. Urner, Minneapolis, Born 1895. University of Minn., 1923. Died July 16, 1938. Aged 43.

Former Members

Axel W. Swedenburg, Thief River Falls, Born 1873. Chicago College of Medicine and Surgery, 1907. Died August 20, 1938. Aged 65.

I have a note that may be of interest. The American Medical Association estimates that the average age at death of physicians in the United States this year was 65.8. Last year it was 65.6. Our average here, if my figures are correct, is a little higher. It is 66.05.

I have a special resolution on the death of Dr. C. H. Mayo.

On the request of the Speaker the following resolution was read by Doctor Cottam and passed unanimously by the delegates.

"Whereas, death has removed from us Dr. Charles H. Mayo, a great humanitarian, a world-renowned surgeon, a beloved member and former president of our Association and

"Whereas, Doctor Mayo and the great institution which he helped to establish has brought world recognition, greater scientific knowledge, greater opportunity for professional attainment and progress to every physician in Minnesota, and

"Whereas, Doctor Mayo had ever at heart the welfare and interests of this Association, of his colleagues in Minnesota and seldom failed to attend these annual sessions.

"Be It Resolved, that in his passing the world has lost a great leader, and the doctors of Minnesota a friend, a teacher of high professional attainments and a distinguished exemplar of the lofty ideals of a great profession whose memory will ever remain with the members of this House and this Association as an inspiration and guide."

Doctor Will: May we stand a moment in reverence?

The House of Delegates arose in a body at this time.

Doctor Will: The House of Delegates meets tomorrow in this room at 12:15.

The meeting was adjourned at 11:45 p. m.

HOUSE OF DELEGATES

Wednesday, May 31, 12:15 p. m.

The meeting was called to order by Doctor Will, Speaker of the House of Delegates, at 12:15 p. m. in the East Room at the Hotel Curtis.

Doctor Will: One point impressed me last night and that was that our meeting fell a little flat. There was very little discussion of the reports, possibly because you were perfectly willing to leave the work of the Association in the hands of the various committees, and possibly—this is more serious—because you had not studied the reports sent you and were not prepared to comment. If that is the truth, it is rather sad. I think if a man is elected delegate he should inform himself on the business under discussion. I am not alone in this thought because a man who has perhaps been more active in the Council and House of Delegates than many others came to me with the same thought.

If any of you have any comments to make on this matter I would like to have an expression at this time.

Dr. A. G. Liedloff, Mankato: In the past if we have had any disagreement we have not been so very popular. That's why a lot of people keep still. We figure that the committees perhaps know more about these matters than we would ourselves.

Dr. W. A. Stafne, Moorhead: I think that the committee reports should be sent to the delegates earlier because, due to the pressure of other work, we really do not have time to study them in detail as we would have if we had them a month in advance.

Doctor Will: The explanation for that is that the reports do not reach the State Office in time to send them out a month in advance. Am I right, Mr. Rosell? That's settled.

Dr. R. N. Andrews, Mankato: There are some of the committees who do not make their reports in writing. Those are the only ones we know of that didn't have proper attention.

Dr. H. Z. Giffin, Rochester: I think it's entirely a matter of making the House of Delegates meeting more interesting to delegates and more instructive to everybody. It occurred to me that possibly each chairman might have some particular topic which he could discuss in more detail before the delegates. It also occurred to me that each delegate might have some topic that bothers him or on which he, himself, might want information. This cut and dried method of passing on committee reports at times falls rather flat, certainly; and anything we can do to make the meeting more valuable would be important.

Dr. W. L. Burnap, Fergus Falls: The reports I've heard of the meeting were certainly the reverse. A number of men have told me they thought that was a very fine meeting last night and I thought so myself.

I don't know how we're going to have more discussion. It was half past eleven when we got out.

DR. F. H. MAGNEY: The Duluth delegation got their reports in plenty of time to read them carefully and call a meeting of delegates. They came down from the range, some of them, to attend the meeting. We found nothing controversial in the reports: they were all very good and there was actually no reason to take up any time on the floor.

Following a report from Dr. Smith, chairman of the credentials committee, that 59 delegates were present, motion was made, seconded and carried that reading of the minutes of the previous meeting be dispensed with and Dr. Giffin was asked to report on the day's Council meeting.

DOCTOR GIFFIN: Superintendent Ray Amberg of the University Hospital met with the Council this morning when one of our members, representing his society, cited several complaints regarding the handling of referred patients at the University hospital. Mr. Amberg expressed his regret, explained that facilities were not adequate to handle all details of these cases properly and declared his intention of reporting the complaints to the Dean of Medical Sciences. It was moved, seconded and carried that several other suggestions for improvement be referred to the Committee on University Relations and that the Committee should find out if there were other similar complaints from other societies with the intention of inviting representatives of these societies to meet with the medical advisory committee of the hospital.

It was moved, seconded and carried that Mr. Brist's contract should be renewed: also that the distinguished service scroll and medal of the Minnesota State Medical Association be awarded to Dr. H. M. Johnson, Dr. C. H. Mayo and Dr. W. J. Mayo and the photographs properly designated be hung in the Medical School at the University. Dr. Stewart was designated to carry out the details of the action.

It was moved, seconded and carried that the surplus each year for MINNESOTA MEDICINE should be placed in a separate endowment fund and allowed to accumulate or to be expended for the benefit of MINNESOTA MEDICINE under guidance of the finance committee of the Council.

It was moved, seconded and carried that the Council approve the suggestion from the Editing and Publishing Committee to amend the By-Laws so as to permit an increase in the number of members on the committee.

The Council also suggested that the House of Delegates take some official recognition of the retirement of Dr. J. T. Christison who served so long as chairman of the Editing and Publishing Committee. It was moved, seconded and carried, also, that a letter of greeting be sent to Dr. A. S. Hamilton.

Now, as to the proposed amendment of the by-laws. This amendment can, if you wish be passed by the House today.

It is as follows: "This committee shall consist of ten members, two from St. Paul, two from Minneapolis, two from Rochester, two from Duluth and two from out in the state; two of whom shall be appointed annually for a term of five years." The committee would have the power under this arrangement of determining its own quorum and there would be more members to whom to refer questionable papers for consideration. Of course, they would have the power of selecting their own chairman.

It was moved, seconded and carried that the report of the Council be accepted following which motion, seconded and carried, was made that the new amendment to the by-laws be adopted.

Dr. Victor Hauser, St. Paul, chairman of the resolutions Committee, read the following resolutions and recommended their adoption.

RESOLUTION ON THE ARMY MEDICAL LIBRARY

WHEREAS, the Army Medical Library is of inestimable value to the progress of medicine in America and to the scientific knowledge and continued research of individual physicians all over the country, and

WHEREAS, it is already over-crowded and the number of volumes added each year is growing rapidly, and

WHEREAS, the services it offers to physicians everywhere are in great demand but cannot under the circumstances meet the demand,

BE IT RESOLVED, that the necessary appropriation be made at once by Congress for construction of the new building authorized by the 75th Congress, and

BE IT FURTHER RESOLVED, that the appropriation should be made promptly so that the collection of medical works which is unique among libraries of the world may be preserved for American medicine.

RESOLUTION ON THE WAGNER HEALTH BILL SUBMITTED BY THE EXECUTIVE COMMITTEE OF THE HENNEPIN COUNTY MEDICAL SOCIETY

WHEREAS, There is now pending in Congress a measure known as the Wagner bill (S. 1620), entitled the National Health Act of 1939, which contains many provisions which we believe are unwise and unworkable either from a public health or an economic standpoint; and

WHEREAS, The bill makes no provision for use of existing unused hospital and treatment facilities; and

WHEREAS, The bill obviously leads by indirection to compulsory health insurance, to which the medical profession is definitely opposed; and

WHEREAS, the House of Delegates of the American Medical Association in its recent session held in St. Louis, while affirming its continued willingness to coöperate with all government agencies in the legitimate handling of public health problems, took a definite stand in opposition to the Wagner bill in its present form; therefore be it

RESOLVED, by the Minnesota State Medical Association that S. 1620 will not promote the public interest in economics or health; and be it further

RESOLVED, that we endorse the action of the American Medical Association in its opposition to S. 1620; and be it further

RESOLVED, that our Senators and Representatives in Congress be apprised of this action and requested to use all possible efforts to secure such modification of S. 1620 as will bring it into conformity with the principles adopted by the American Medical Association and the Minnesota State Medical Association, or, failing in that, to oppose its passage.

Submitted by the Hennepin County Delegation
by GILBERT COTTAM, *Chairman.*

RESOLUTION ON THE RETIREMENT OF DOCTOR CHRISTISON

WHEREAS Dr. J. T. Christison served our association with devotion and great distinction for many years as president, as committee chairman and as the delegate of this association to the House of Delegates of the American Medical Association, and

WHEREAS Dr. Christison has retired from the active practice of medicine in which he has earned renown as a physician and the trust and affection of patients and colleagues, alike, and

Whereas he has now resigned his office as delegate and as chairman of the Editing and Publishing Committee as a consequence of his retirement,

Be It Hereby Resolved that in his resignation this House and our association have lost an officer who made an inestimable contribution to the progress of medicine in Minnesota and also a personal friend whose association meant much to every member and officer of this association, and

Be It Resolved, also, that a message of regret, affection and good wishes of this assembly be sent Dr. Christison from the members in session here today.

RESOLUTION ON THE STATE BOARD OF HEALTH

The State Department of Health has made important contributions to the work of our association during the past year, in its contribution to the monthly packets distributed to members, in its arrangement of postgraduate courses throughout the state and in its laboratory aids to the practice of medicine. It has consulted closely, furthermore, with the officers and council of the association in advance of each new step in its broad program of public health in Minnesota and coöperated fully with the practicing physicians of the state administering this program with the result that Minnesota's morbidity and mortality records are a source of pride to every citizen.

For these reasons the gratitude and appreciation of this House of Delegates is hereby extended to the members of the Board, to Dr. A. J. Chesley, executive officer, and to his staff.

RESOLUTION ON THE STATE BOARD OF CONTROL

The appreciation of this House is also extended to the State Board of Control, its chairman, Mr. C. R. Carlgren, and to Dr. H. E. Hillboe, director of Services to Cdippled Children, for their excellent program of medical and institution care for the needy, and the chronically ill, and for their close coöperation with officers and Council in planning and administering this program. The care and attention to the rights of the private practitioner who shares in the work should be especially commended.

RESOLUTION OF THANKS TO COÖPERATING AGENCIES IN THE PUBLIC HEALTH SHOW

In view of the fact that the Public Health Exposition, which is now being held for the first time in connection with this meeting, would have been impossible without the aid of the State Department of Health, the State Board of Control, the Minneapolis City Health Department, the University of Minnesota and many other health and welfare agencies of Minneapolis and of the state, the House of Delegates hereby acknowledges its great debt to these organizations. Our thanks are due especially to all who are contributing their time to the daily program of demonstrations, lectures and moving pictures with especial appreciation for the boys and girls who have so willingly consented to take part in this great exposition.

RESOLUTION OF APPRECIATION TO DOCTOR GILKEY

Much of the credit for the operation of Minnesota's system of medical care for recipients of relief is due to the careful, sympathetic supervision of Dr. S. E. Gilkey, medical director of the State Relief Department. The friendly coöperation and fairness of Dr. Gilkey in administering regulations and in adjusting medical fees is likewise gratefully acknowledged by this House.

RESOLUTION OF THANKS TO THE HENNEPIN COUNTY MEDICAL SOCIETY

The splendid hospitality and unique entertainment provided for members and guests by the Hennepin County Medical Society for this meeting deserves the thanks of every member. The appreciation of this House is hereby recorded for the energy and careful planning by Dr. A. E. Cardle and his fine committees, for the arrangements and the social events and particularly the unusual banquet, all of which are contributing so much to the enjoyment of this great meeting.

RESOLUTION OF THANKS TO MINNEAPOLIS NEWSPAPERS

The House of Delegates wishes to express its obligation to the newspapers of Minneapolis for their excellent reporting of scientific events in this meeting and of their generous allocation of space for important announcements made in advance of the meeting.

RESOLUTION OF THANKS TO RADIO STATIONS

Our thanks are also extended to radio stations WCCO, WTCN, KSTP, and WMIN for their generous contribution of radio time for announcements of the Public Health Exposition and talks by our officers and guests. This contribution was indispensable to the success of the public health exposition and to the interest of the scientific sessions and warrants the cordial appreciation of this House of Delegates.

RESOLUTION OF THANKS TO SPECIAL SOCIETIES WHO PROVIDED SPEAKERS

Five special societies have financed the appearance of distinguished out of state speakers for this convention. In so doing, these societies, several of whom are following a precedent of several years, are contributing immeasurably to interest and value of this meeting.

The contribution of these societies, including the Minnesota Society of Internal Medicine, the Minnesota Radiological Society, the Northwestern Pediatric Society, the Northern Minnesota Medical Association and the Trudeau Society, is gratefully acknowledged by this House.

Doctor Hauser: The Committee recommends that the resolution adopted last night on the death of Doctor Mayo be published in Minnesota Medicine, that a copy be sent the family and that it be inscribed in the minutes of the association.

Motion was made, seconded and carried to adopt the resolutions and the recommendations of the Resolutions Committee.

ELECTION OF OFFICERS

The Speaker then called for nominations for the office of president-elect.

Dr. B. S. Adams of Hibbing was nominated for the position of *president-elect* by Dr. F. H. Magney of Duluth in behalf of the delegates from the St. Louis County Medical Society.

There being no further nominations, it was moved, seconded, and carried that the nominations should be closed and that the Secretary should cast a unanimous ballot for Doctor Adams for the office of president-elect.

Dr. Carl M. Johnson of Dawson was similarly nominated for the position of *first vice president* and, there being no further nominations, it was moved, seconded and carried that the nominations be closed and that the

Secretary be instructed to cast a unanimous ballot for Doctor Johnson for first vice president.

Dr. A. E. Cardle of Minneapolis was nominated for the position of *second vice president* and, there being no further nominations, it was moved, seconded and carried that the nominations be closed and that the Secretary be instructed to cast a unanimous ballot for Doctor Cardle for second vice president.

Dr. B. B. Souster of St. Paul was nominated to succeed himself, as *secretary* and, there being no further nominations, it was moved, seconded and carried that the nominations be closed and that the President be instructed to cast a unanimous ballot for Doctor Souster for secretary.

Dr. W. H. Condit of Minneapolis was nominated to succeed himself for the position of *treasurer,* and, there being no further nominations it was moved, seconded and carried that the nominations be closed and that the Secretary be instructed to cast a unanimous ballot for Doctor Condit.

Dr. W. W. Will of Bertha was nominated to succeed himself as *speaker of the House of Delegates.*

Dr. E. A. Meyerding, vice-speaker, was asked by Speaker Will to take the chair. There being no further nominations, it was moved, seconded and carried that the nominations be closed and that the Secretary be instructed to cast a unanimous ballot for Doctor Will to succeed himself as Speaker of the House of Delegates.

Doctor Will resumed the chair and *Dr. E. A. Meyerding of Saint Paul* was nominated to succeed himself for the position of *vice speaker.* It was moved, seconded and carried that the nominations be closed and that the Secretary be instructed to cast a unanimous ballot for Doctor Meyerding for vice speaker.

Dr. A. E. Sohmer of Mankato was nominated as *councilor of the fourth district* to succeed Dr. J. S. Holbrook of Mankato, who had requested that he be retired from the Council. There being no further nominations, it was moved, seconded and carried that the nominations be closed and that the Secretary cast a unanimous ballot for Doctor Sohmer for councilor of the fourth district.

Dr. C. A. Stewart of Minneapolis, *councilor of the sixth district* and *Dr. W. L. Burnap* of Fergus Falls, *councilor of the eighth district,* were nominated to succeed themselves as councilors of their respective districts. It was moved, seconded and carried in each case that nominations be closed and that the Secretary cast unanimous ballots for each as councilors.

Dr. F. J. Elias of Duluth was nominated as *councilor of the ninth district* to succeed Dr. B. S. Adams of Hibbing, previously elected to the position of the president-elect, and it was moved, seconded and carried that the nominations be closed and that the Secretary be instructed to cast a unanimous vote for Doctor Elias as councilor of the ninth district.

Nominations were called for to fill the position of one delegate to the American Medical Association with his alternate whose terms expired.

Dr. F. J. Savage of St. Paul was nominated to succeed Dr. J. T. Christison as *delegate* and *Dr. J. M. Hayes* of Minneapolis was nominated to succeed Dr. E. A. Meyerding, *alternate.* It was moved, seconded and carried that nominations be closed and that the Secretary be instructed to cast a unanimous ballot for Doctor Savage as delegate and Doctor Hayes as alternate.

Dr. B. S. Adams: I sincerely appreciate the honor you have conferred upon me. I also realize that election to the presidency of the Minnesota State Medical Association carries with it a rather heavy responsibility. I shall do my best to fulfill the duties of my office and meet questions as they come up and I hope with your assistance to make next year a good year. We have many problems before us. I think if we have the same coöperation as we have had in the past that we will go a long way towards solving them. I hope that during the coming year, with your assistance, we will continue to make strides. I thank you.

Dr. H. Z. Giffin: As Chairman of the Council, I would like to express the sentiments of the Council, in their regret at Doctor Holbrook's retirement. Doctor Holbrook has been very faithful in the discharge of his duties. His judgment has always been good on the Council. We have certainly enjoyed our association with him and have come to love him. He asked to be relieved of his office two years ago for personal reasons and was persuaded to remain. Now the Council feels, with the House of Delegates, that his resignation should be accepted and I am very happy to have this opportunity of expressing our appreciation of his work.

Dr. J. S. Holbrook: There are some very fine men on the Council and I have enjoyed my association with them the last six years. I have a little feeling of regret, of course, in leaving, but I feel that my successor will be a better councilor than I and I am glad you have elected him.

PLACE OF MEETING

An invitation from the Olmsted-Houston-Fillmore-Dodge County Medical Society to the Minnesota State Medical Association to hold its 87th Annual Meeting in Rochester was presented by Dr. A. W. Adson.

It was unanimously voted to hold the 87th Annual Meeting in Rochester.

The meeting adjourned.

Abdominal Supports, Corsets, Special Supports and Trusses

At its annual meeting, January 13-14, the Council on Physical Therapy discussed the question of further consideration of abdominal supports, corsets, special supports and trusses. In the opinion of the Council, the therapeutic value of these products is achieved only when they are fitted properly to the individual patient from an anatomic and physiologic point of view. It was the opinion of the Council that the therapeutic purpose for which corsets and abdominal supports were originally considered by the Council has been lost sight of. Therefore the Council will no longer give consideration to various makes of abdominal supports, corsets, special supports and trusses (effective at once) but will sponsor a series of articles relative to the use of these appliances from the standpoint of orthopedic surgery. The Council will ask those firms having accepted products to delete the seal or any mention of Council acceptance from their advertising matter and descriptive literature by January 1, 1930. (Jour. A.M.A., June 3, 1939, p. 2276.)

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

(Continued from page 556)

At the trial, Dr. Kistler was a witness for Dr. Lemke and stated that the deceased was in his office on December 1 and 3, 1938. He denied that the girl was in his office on December 8, the day she first went to Dr. Lemke. The state offered evidence that the girl was referred to Dr. Lemke by Dr. Kistler, and, in addition that she was in Dr. Kistler's office on the 8th of December. Despite the fact that a post-mortem examination had been made and testimony presented by Drs. Clawson and Hobbs that death was caused by "hemorrhage following an abortion criminally induced," Dr. Kistler testified that death was caused by "bromine poisoning." The verdict of guilty by the jury clearly indicates that they did not believe the testimony of Dr. Kistler.

The Medical Board advised Dr. Kistler that in their opinion his story was not worthy of belief and that any repetition of similar facts or circumstances would result in the suspension or revocation of his license to practice medicine.

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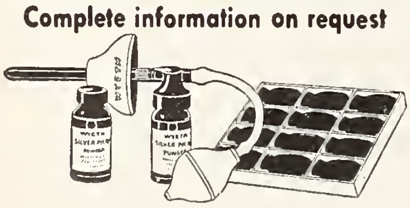

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THE TUBERCULOSIS PROBLEM VIEWED IN THE LIGHT OF RECENT PATHOLOGIC STUDIES*

HENRY C. SWEANY, M.D.†

Chicago, Illinois

IT IS with the greatest of pleasure and enthusiasm that I find myself returning to this platform after six years of absence. I am thankful to my many good friends who were instrumental in this cause. Most of all, I am deeply conscious of the honor bestowed upon me to give this lecture in honor of one of America's great pathologists, and a pioneer teacher of that subject.

Apart from the more enjoyable reactions, however, I feel a sense of inferiority: First, in attempting to do honor to Dr. Bell; and, second, in bringing "tuberculosis to Newcastle."

In the presentation of the subject of the evening, there are two great principles that may well be kept in mind. First, it is important always to be aware of a changing world.

"The old order changeth, yielding place to new," applies in evolution, general science, general medicine, tuberculosis, et cetera, as well as to King Arthur's knights. It is equally important to realize that as a result of this change and the limitations of man's ability, *finality* is an illusion that, like the horizon, is never reached.

With these facts in mind to temper our assertions, let us approach the tuberculosis problem with restraint but with confidence in our special senses and the ability to reason from elementary premises.

As a result of change in man's environment, the infection rate of tuberculosis has also been changing. Dating from antiquity, urbanization and industrialization have caused every race to pass through a marked increase in tuberculosis, roughly following the pathways of civilization. The important features are that they have increased, first, the number of contacts by bringing people closer together, and, second, have imposed more severe working conditions that have enhanced the progression of the disease.

Practically every people has gone through such a cycle from a negligible infection rate in the more primitive, to a high rate in the congested and industrialized city.

After reaching a peak of mortality, however, each group apparently settled back to a constant rate when a balance was set up by natural immunizing forces against the spreading disease. Many who became infected made uneventful recoveries, and with the recovery came a relative increase in resistance that protected against subsequent infections. Had this not happened, the race would have become extinct long ago. This balance kept its status quo down the centuries, until it was upset by the discovery of the tubercle bacillus, which has effectively brought the public health machinery into play against the cause and effects of the disease. The results directly and indirectly seemed to have caused the infection rate to fall and along with it the morbidity and mortality. Today the death rate is only about one-tenth what it was at the peak before 1882, and the infection rate is almost parallel with it.

With these changes and dependent upon them, the infection rate has kept on decreasing as tuberculin surveys over the past fifty years indicate. If the rate continues to decrease, the human race will eventually be infection-free, a

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*The John W. Bell Lecture on Tuberculosis presented before the Hennepin County Medical Society, April 3, 1939.

†From the Research Laboratories of the City of Chicago Municipal Tuberculosis Sanitarium.

TABLE I—HYPOTHETICAL SHIFT FROM YOUNGER TO OLDER AGE GROUPS AS THE INFECTION RATE DECREASES

Infection Rate per year	Years	% Childhood	% Adult	Ratio A/Ch	% Uninfected	Ratio I/U
8%-100% by	12.5	100	0	0	0	0
5%-100% by	20	70	30	0.4:1	0	0
3%-100% by	33	42	58	1.4:1	0	0
2%-100% by	50	28	72	2.6:1	0	0
1.5%- 91% by	60	21	70	3.5:1	9%	10:1
1.0%- 60% by	60	14	46	3.3:1	40%	1.5:1
0.5%- 30% by	60	7	23	3.3:1	70%	0.4:1

condition comparable to that existing in America's cattle herds.

As shown in Table I, this state has already been reached in most communities where the infection rate is below 1.5 per cent.

Another result of this change is that as more and more children reach adult life without infection, there is going to be a relative increase in the number of infections in adult life, limited only by the number of years of that age period. It should be pointed out at this time, however, that this infection incidence has no bearing on the relative prevalence of disease in the two age groups, information concerning which I have no accurate data at present.

Such a preliminary view of the shifting sands on which accurate statistics may be compiled should make us realize how difficult it has been in the past and how risky it is now to present anything purporting to be permanent or accurate. The types of infection, ages of host, ages and stages of the disease, and the myriad accidents of life coming to play on any infection, cause this condition to exist. Nevertheless, an attempt will be made to include as many facts as possible in a comprehensive outline.

So long as straight morbid anatomy is concerned, a classification may be made; but this cannot be done if it is to serve all purposes. It must be dovetailed into epidemiology and pathogenicity, as well as clinical and x-ray findings, to be comprehensive.

A feature of major importance, therefore, towards this end seems to be to recognize tuberculosis as an evolutionary process. In the vast amount of study on the disease, little emphasis has been placed upon the *age of any particular process.* True, the clinical groupings of "a, b, and c" for each stage of disease, and the terms fibroid and pneumonic, point in this direction, but it does not cover all phases of the disease.

Like anything else biological, tuberculosis has a beginning, a development, and an ending. The outcome of any case becomes easier to foretell when the "phase" or age of the disease is known. At the beginning or "sunrise" of the disease nobody can tell what will be the extent of involvement, the virulence of the germ, or the resistance of the host. Many patients have only a small lesion that soon becomes fatal; others will heal uneventfully. An overwhelming process may be rapidly fatal or drawn out into a chronic process when fibrosis has walled off cavities and calcification has been well established. After fibrosis has become predominant with the clearing of exudates and the appearance of emphysema, the "sundown" of the disease appears, bringing with it many distressing sequelæ, such as emphysema, bronchiectasis, right heart failure, etc., some of which may not be recognized as tuberculosis at all. This stage is vastly different from the beginning stage.

In order to take more cognizance of the *age of the disease,* I have attempted in recent years to establish criteria of age wherever possible. For primary tubercles the results have been gratifying in the majority of cases. In later stages of the disease it has not been so promising.

The best that can be offered is a classification that takes into consideration the rather short beginning and variable middle and end stages. In submitting such a plan it must be stressed that it is used only as a skeleton around which the various facts may be arranged. There is no intent in offering a substitute for the present order which is altered from time to time as necessity demands or new facts dictate, by properly constituted committees. Like many other innovations, this new classification is bound to have imperfections. For example, the middle period may represent a long succession of new episodes as the disease spreads. The end may be sudden as a terminal hemorrhage, or may be drawn out over years. But such variations cannot be controlled by any classification, old or new.

The proposed outline considers tuberculosis infection as a closely interwoven entity with predominant trends in first infection on one extreme, and the reinfection on the other, with a blending of the two in the intervening types. It considers first an underlying pathology with the evolutionary development of the process and the resulting clinical and x-ray findings as supplementary to them wherever they make their appearance. A chronological sequence will be adhered to as much as possible. It is to be a living or moving caravan that will keep pace with all the changes.

Pathogenesis and Elementary Pathology of Tuberculous Infection with a Few Dependent Clinical and X-ray Findings

I. *First Infection*—may be at any age. Clinical findings are slight. Usually there is a perifocal infiltration as shown on the x-ray.
(The tuberculin reaction turns positive three weeks to three months after infection; usually the time is shorter as the mass of infection increases.)

- A. Childhood—in the past generations they were in the majority. They may be classed on a basis of *quantity* of tissue involved, as:
  - 1. Minimal—with only a few lobules, about 1-2 cm. of inflammatory zone.
  - 2. Moderately Advanced — several lobules, about 5 cm. of inflammatory zone.
  - 3. Far Advanced—about 10 cm. of inflammatory zone.
- B. Adult—greatly on the increase as a result of decreasing rate of infection. Some typical, others atypical—prone to simulate reinfection with decreasing size of lymph node complex compared to the childhood type.
- C. Typical evolution of all primary lesions.
  - 1. Early evolution—progressive from local bronchopneumonia with focal and perifocal inflammation, caseation, cavity formation, depending on the size of the lesion.
    - (a) First stage (Ranke) with lymph nodes becoming progressively involved over the first few weeks and months, progresses towards the blood stream. Focal and perifocal as in lungs.
    - (b) Second stage (Ranke) with generalization in the blood stream, to the lungs and beyond. The foci vary from a few to myriads, may spread to secondary lesions.
  - 2. Middle evolutionary period. The lesion becomes more stationary and focal; lesions of varying stages of regression, with a gradual thickening of capsule.
  - 3. Late evolutionary period—"foreign body" calcareous lesions of stony hardness, tuberculin becoming negative. Some lesions become completely resorbed.

II. *Disease Emanating from Primary Lesions—"Endogenous Reinfection."*

- A. Rapid progression from primary.
  - 1. Local spread.
    - (a) Rupture—open lesion into bronchioles or bronchi with bronchial extension (descending endobronchitis).
    - (b) Overflow to the blood stream (artery, more commonly veins); and lymphatics.
  - 2. Lymph node episodes, lead to
    - (a) Perivascular effusion.
      - (1) Retrograde lymph flow clearing without foci of caseous bronchopneumonia.
      - (2) Caseous pneumonia with varying degrees of ulceration and fibrosis.
    - (b) Enlarged nodes in and around the main bronchi and hilum leading to,
      - (1) Bronchitis (hilum catarrh of Ranke) due to filtering through of the bacilli, toxins, etc., and a desiccation of mucus causing cough, wheezing, etc.
      - (2) Atelectasis.
        - a. Without parenchymal disease.
          - 1. Clearing with mild emphysema.
        - b. With parenchymal disease.
          - 1. A "lobitis" or fibroid type with little caseation, blends into
          - 2. A caseous pneumonia, or bronchopneumonia.
    - (c) Rupture—bronchial extension to lung parenchyma with acinous nodose, bronchopneumonia and pneumonic lesions; also to pleura, to mediastinum, to esophagus.
- B. Exacerbation of a primary—after a long period of quiescence.
  - 1. Local lesion.
    - (a) Rupture—also daughter colony infiltrates, rupture resulting in bronchial spread, with lesions characteristic of bronchial spread.
  - 2. Lymph node.
    - (a) Slow flowing into bronchial and vascular routes.
    - (b) Late rupture with bronchial spread.
  - 3. Hematogenous lesions deposited usually from vascular (pulmonary) extension.
    - (a) Lungs—forming miliary and nodular seeding that may ulcerate into

        thin-walled and "alternative" cavaties. Few symptoms.
    (b) General—all forms of extrapulmonary lesions, and generalized miliary tuberculosis.

III. *Exogenous Infections.*
  A. Superinfection — on another smouldering process.
  B. Reinfection—on a completely healed process, all types of pathology of reinfection.

IV. *Quantity, Character and Position of Reinfection Lesion.*
(They usually begin in the upper and posterior aspects of the lungs. Most commonly in the subapical bronchi in progressive disease; in apical bronchi in benign forms; less in horizontal and apex of lower lobe.)
  A. Minimal in quantity.
    1. Early age of lesion; tiny flecks on the x-ray picture in second interspace and apex; no extension; if Mantoux is negative then turns positive, it is probably a primary.
    2. Middle age of lesion; flecks encapsulated; no extension; Mantoux positive.
    3. Late age of lesion.
      (a) Flecks becoming encapsulated or healed—also include typical Puhl, Simon Stefko nodular foci.
  B. Moderately advanced.
    1. Early age period; first few months after onset; infiltrates; flecks; located as in minimal lesions; but involving a larger area. May or may not have clinical symptoms.
    2. Middle age period; months to years and decades after infection.
      (a) Fibrocaseous, ulcerative, progressive lesions. Late nodular lesions, round infiltrates, acinous nodose tubercles, fibrocaseous and ulcerative lesions, cloudy infiltrates and bronchopneumonia with the process beginning to appear in the anterior bronchi. Spread usually by bronchi, but also by blood and lymph.
      (b) Fibroid, healing, healed, cleared with emphysematous residue; retrogressive. Sometimes bullous emphysema in apices.
  C. Far advanced.
    1. Early age period—first few months after onset—massive infiltrates, pneumonia, etc.
    2. Middle age period—from months to years after infection; fibrocaseous, ulcerative and pneumonic—extending to the anterior parts of the lungs.
    3. Late age period—months to decades after infection.
      (a) Terminal; months to years after infection, all other locations and also gravity infiltrates and cavities—progressive. Spread by bronchi, blood and lymph channels.
      (b) Healed, years to decades after infection, healing fibroid — retrogressive, bulbous emphysema in bases.

V. *Extra-Pulmonary Tuberculosis.*
Hematogenous—with generalized miliary spread. Pleurisy—bronchial, tracheal, laryngeal, gastrointestinal, genito-urinary, bone, skin, meninges, etc.

VI. *Paratuberculosis*—disease phenomena, due to
  (1) Filtrable.
  (2) Non-acid-fast.
  (3) Atypical forms of the tubercle parasite, largely hypothetical.

VII. *Complications and Sequelæ*—Hemorrhage, fatty changes, amyloid, emphysema, bronchiectasis, etc.

VIII. *Associated Diseases.*
Carcinoma, diabetes, syphilis, heart disease, pregnancy, etc.

To clarify this outline, an exposition of most types will be given with a well chosen case history and with pathologic findings for a few of the types not ordinarily understood.

As mentioned before, the first infection in tuberculosis may be at any age. In past generations it has been more common in children, but there is taking place a gradual shift into the adult ages as the infection rate decreases. There is a considerable difference, however, in the appearance of the infection in children and that occurring for the first time in adults.

Classical Primary Lesions

As a result of the classical description of Parrot, Küss, H. Albrecht, E. Albrecht, Ghon, Ranke, Opie, Armand-Delille, Lestocquoy, and others, the primary infection in children is well understood. There is a local infection that progresses towards the blood stream through the lymphatics and ultimately results in a spread throughout the body. But this is about the only thing in common even in children. There are no two infections that appear exactly alike. Some infections occurring in certain colored and aboriginal peoples cause a violent local perifocal reaction that sometimes progresses to a caseous pneumonia. The lymphatics may become tremendously involved and there may be an extensive hematogenous dissemination to all the organs. If it terminates it usually does so as a meningitis, either as a spilling into the ventricles of the brain from a belated overflow of a tuberculosis focus or a shower of bacilli that may occur at any moment from tubercles in the lungs or bronchial lymph nodes. In others this perifocal inflammation and tendency for hematogenous dissemination may be much less marked or last only for a brief interval.

The local lesion may range in size all the way from a few lobules of bronchopneumonia to many foci throughout both lungs, or to one large focus occupying most of one lobe or one

TABLE II. CHANGES IN VOLUME IN CUBIC MILLIMETERS IN THE COMPONENTS OF PRIMARY LESIONS AS AGE ADVANCED IN A SERIES OF KNOWN SEVERE CONTACTS

Age Period	Number of Cases	Average Volume Parenchymal Lesions	Average Volume Bronchial Node Lesions	Average Volume Tracheal-Bronchial and Tracheal Lesions
0-5	11	210	450	1350
6-10	9	87	555	805
11-15	9	31	92	137
16-20	10	33	73	12
20+	5	9	16	6

TABLE III. COMPARISON OF THE DURATION OF THE CLINICAL DISEASE AND LATENT PERIOD IN VARIOUS AGE GROUPS OF A SERIES OF SEVERE CONTACTS

Age Limits of Infection (years)	Number	Average Years of Clinical Disease	Average Years of Latent Period	Average Age at Death
1-5	14	6.1	18.5	27.1
6-10	18	3.4	12.6	23.5
11-15	23	2.8	7.8	23.1
16-20	14	2.1	5.9	25.5
20-26	9	4.0	3.5	30.0
Grand Average	78	3.5	10.0	25.8

lung. Dosage of bacilli has much to do with both size and character of the lesions.

If the patient survives, the lesions usually undergo a gradual retrogression with time. The perifocal infiltration thins out and disappears. The capsule gradually becomes heavier for eight or ten years and shrinks. After five or six years, resorption begins between the capsule and the calcified core and continues throughout life. At around the ten year period bone begins to form around the resorption areas, capillaries fill in, to be followed by lymphoid and marrow tissue formation. This usually becomes more marked in the majority of tubercles as age advances. Many of these local calcified lesions become entirely resorbed; others remain throughout life.

Adult Primary Lesions

When older people are infected for the first time, however, there are certain variations from these classical primary infections observed in children. Many of the lesions may be typical, as in children, but a large number are atypical in that they are usually found in the apex or along the subapical bronchi. They are usually rather small foci whose capsules are not well developed, and the calcification is not liable to be so dense. The lymph nodes towards the hilum are usually smaller and sometimes even lacking (Table II). As the capsules are usually not so well developed there is a tendency for these tubercles to spread by an overflowing process until they encroach upon a bronchiole or bronchus, after which there may be varying degrees of reinfection in the other parts of the lung which is ordinarily correctly viewed as a "reinfection" type of tuberculosis.

When these adult lesions fail to heal there is usually a more rapid evolution of the process from the primary to the reinfection type of disease. While in infants and children this latent period may extend for ten to twenty years, it usually averages only a few years in adults. Perhaps the greater number of infections in adults do not develop into disease, but when they do there is usually more rapid progression than in children. It will be seen that this variable condition focuses active tuberculous disease in the young adult life. This is shown in Table III.

An important feature is that it is practically impossible to tell these adult primary lesions from the reinfection type *during life* because the lesions are usually small, out in the parenchyma, and poorly calcified. The tuberculin test is the only aid that is certain.

Primary Sequelar Lesions (Bernard)

The extent of progression to the "reinfection" type of disease from primary lesions is quite variable. In a recent study of close contacts, I found that nearly 75 per cent of patients coming to autopsy in our sanitarium, developed the disease directly or indirectly from the primary. In other communities, or in older age groups with more casual contacts, there is no doubt a much higher rate of exogenous reinfection.

The methods of spread from these first infections are also quite numerous and variable. In a large number of the lesions there is a rapid progress which is sometimes termed the *progressive primary tuberculous lesion.* The mechanism of this spread is usually not detected because it has destroyed much lung tissue before the pathological examination can be performed. Occasionally, however, the "breaks" in the defense mechanism can be found. Owing to the fact that there is no way of telling the ending of the primary and the beginning of reinfection, it seems logical to study them as one process, that is altered by allergic states, age, and to a less extent diet, race, et cetera. The local lesion may spread rapidly in pneumonic fashion or the tubercles may spread by "overflowing" the capsule.

As the disease progresses down the lymph channels toward the hilum there is a penetration of the perivascular spaces by toxins with a resulting tumefaction of all the adjacent lymph nodes. One reaction to this condition is a back-up or a stasis of lymph flow which on rare occasions may be seen on the x-ray picture as a gradual diminishing shadow from the hilum out to the base of the upper lobe. It may extend upward towards the middle of the lobe. This process may clear without leaving anything but a moderate amount of perivascular fibrosis (Case 1). On the other hand, it may cause a back-up into the tissues and result in a caseous pneumonia. The result depends largely upon the number of infectious microörganisms present. At the same time the process may extend through the bronchial wall into the lumen of the bronchus and set up a so-called bronchial catarrh. Bacilli may filter through the bronchial wall during this time and cause a positive sputum.

At this stage, a marked irritation of the bronchi frequently occurs, with a stimulation of the mucous flow that may be reflected clinically as varying degrees of severity of "asthmatic bronchitis." At first there is usually a marked increase of glairy mucus with mucopurulent flecks. Tubercle bacilli are not numerous, but present. Later inspissation of the mucus occurs and mucus plugs may form that occasionally lead to massive collapse of the lobe. This is sometimes not detected until it is seen on the x-ray picture. Atelectasis resulting from this form of collapse may be of varying degrees of severity. It may clear up rather promptly following the removal of the obseruction. In that event all that remains may be only a mild emphysema. It may also assist in the production of an effusion in the pleura.

Case 1.—A. I. was a thirty-two-year-old man of Russian descent. His mother was suspected of having had tuberculosis, and he worked as an orderly in a large general hospital just before his onset.

At the onset he had a pleuropneumonia for two days, following which he had fatigue and loss of weight. A few months later he had an acute attack with cough and a temperature of 103°. A diagnosis of tuberculosis was made on physical examination and x-ray. The sputum was at first negative but later was positive. There was a gradual recovery but occasionally a rise in temperature would occur.

The first x-ray revealed a slight left apical lesion with a small cavity also at the apex of the left lower lobe. The two points of origin of infection perhaps caused such a lymph node enlargement that there resulted a "back-up" into the upper lobe, as shown in the second x-ray. This cleared within the next few months, as shown in Figure 3.

In other instances there may be an obliterative caseous endobronchitis that leads to permanent atelectasis. This is the condition that has been called by Bernard "lobitis," where there is a gradual contraction of the lobe towards the spine. The atelectatic lung undergoes fibrous contraction and adhesion to the mediastinal surface followed by a pulling up of the non-rigid lung below. This happens more frequently on the right side than on the left. The more severe degrees of involvement may disseminate a sufficient number of bacilli in tissues to cause a caseous pneumonia or a fibrocaseous tuberculosis. The mechanism of this will be described and illustrated.

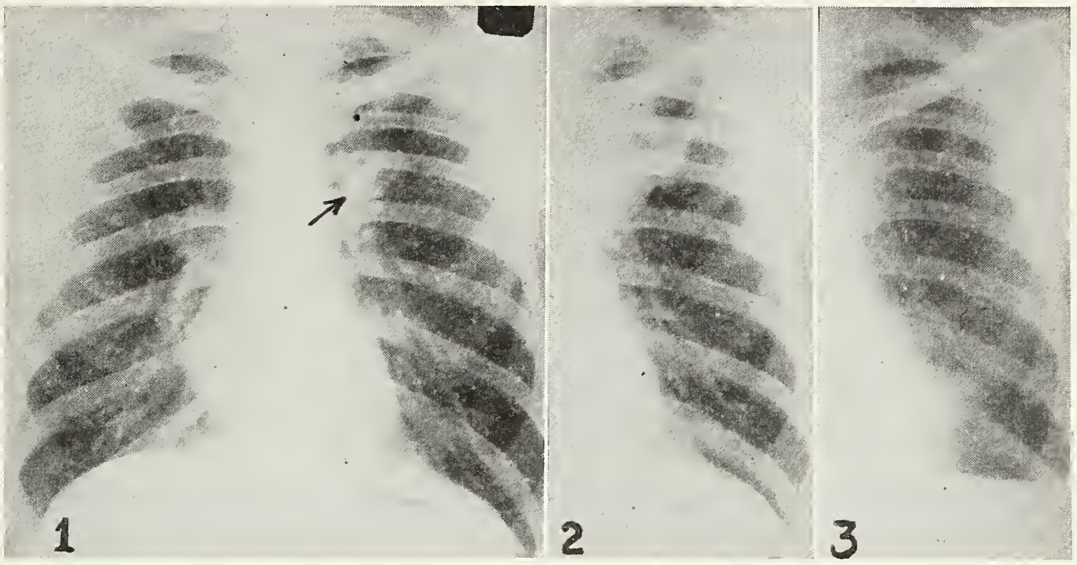


Fig. 1. Case 1. Roentgenogram taken January 12, 1931. Note beginning shadow in left hilum.
Fig. 2. Case 1. July 12, 1931—The infiltration has spread out towards the pleura.
Fig. 3. Case 1. January 13, 1933—Almost entire resorption.

The lymph nodes lying near a bronchus may compress the walls so that it is difficult for air to pass. Dyspnea with ronchi and sibilant noises are usually the result. If the inflammation extends into the bronchial walls there is a whole series of changes that are not ordinarily recognized. Belonging to this is the condition referred to by Ranke as "hilus catarrh." The toxins enter the wall of the bronchus and interfere with the secretion of mucus. It gradually becomes inspissated and may plug the bronchus, which is already narrowed by compression, in which case a temporary atelectasis results. If it does not clear within a short time, a permanent atelectasis may ensue with a resulting fibroid lobe.

Atelectasis of one lobe may consist of the so-called lobitis or sometimes the lobe may become infected with bacilli with a resulting caseous and fibrocaseous tuberculosis. All degrees of change exist between the two extremes. One case will be cited.

Case 2.—B. G. was a nineteen-year-old American woman at the time of death. There is nothing unusual in the history. The fact is there is no record of any illness except a pneumonia in infancy. She began to cough in November, 1936, and went to a doctor who treated her for "bronchitis." Another doctor told her that an x-ray "would settle the matter, but was unnecessary." Another could find nothing and dismissed her with the comment that she "was too well." In September, 1937, still another doctor annually became active and performed a tonsillectomy; but the cough, for which it was performed, did not improve, in fact it became productive. He then took an x-ray and diagnosed pulmonary tuberculosis.

Outside of the wholesome lesson to the medical profession, this case afforded a fine study of the effects of lymph node involvement on the subsequent course of the disease, including the clinical, x-ray and pathologic findings. A roentgenogram, taken on admission, showed a dense shadow along the spine about 2 cm. broad, from the apex to the hilum. There were infiltrative areas in the upper parts of both lungs, characteristic of tuberculosis. A roentgenogram taken a few months before death revealed a pneumothorax with a partial collapse on the right.

At the postmortem there was found an atelectatic left upper lung lobe and recent solid masses throughout the left lower lobe and the right upper. There were scattered acinous nodose lesions in the lower parts of the right. On sagittal section there was found a dry spongy left upper lobe and tuberculous masses, cavities, and nodules elsewhere. Forming a ring around the main upper lobe bronchus were three calcified tubercles of 5 to 7 mm. dimensions. The lumen was definitely narrowed.

There was a mild degree of bronchiectasis in the principal bronchi of this lobe. There were several scattered calcified foci throughout the lobe with the largest one about 5 mm., in the apex. There was a dry spongy atelectasis throughout the parenchyma with no caseation and consolidation, and only a slight amount of fibrosis.

The microscopic sections revealed a uniform age character of all the calcifications consisting of a small central calcified core and an early specific capsule of moderate thickness. The middle capsule was rather thin. In an adult, the oldest tubercles corresponded to a four or five year process.

The parenchyma of the collapsed lobe was a rather uniform atelectasis with an occasional nodular tubercle, some of which had calcified centers.

The bronchi at the level of the lymph nodes consisted of a fibrosis extending in from the nodular tubercles towards the lumen. The mucosa was ulcerated in many places.

Comment.—This case illustrates a peribronchial lymph node phenomenon that led to atelectasis. Had this case been diagnosed in time, it may have been only a simple "lobitis," with uneventful recovery. The reference to the lapses in diagnosis are not given with any malicious intent, but to point out, in an earnest manner, one of the great needs in our medical education.

Finally, the lesions in the lymph nodes may become caseous and extend into the lumen of the bronchi, first as elevated nodular tubercles, then as open ulcers which may expel the lymph node contents with varying degrees of subsequent involvement. Much depends upon the richness of the growth of tubercle bacilli in the discharging node. There may be little or no subsequent disease, or there may be a diffuse terminal infiltration or acinous nodose spread throughout the lungs. Most of these are common and need no special elucidation. One mild result may be profitably shown.

Case 3.—R. C., a case of massive atelectasis, was a married woman, aged twenty-seven, who was in contact with a sister-in-law three years before entry into the sanitarium. The onset of the disease was insidious during the summer of 1938. She began to feel tired and sleepy most of the time, lost weight, and complained of a tightness in the chest, and that the wheezing was so marked it kept her awake. The sounds were in the expiratory cycle and could be "felt" along the left side of the sternum. A doctor ordered an x-ray examination (Fig. 4), which revealed tuberculosis, and her sputum was found positive for tubercle bacilli. She began to run a slight temperature and then suddenly experienced a sudden pain in the left chest, not very severe, but she promptly became short of breath. Her doctor diagnosed atelectasis.

On bronchoscopic examination by Dr. Sorboroff, there were observed several pearly nodules pushing up the wall of the left main bronchus, measuring 3 to 4 mm. across and about half closing the lumen. One was excised and was found to contain many acid-fast bacilli. The atelectasis gradually cleared.

Comment.—This is clearly a perivascular and peribronchial extension from the lymphatics, resulting in first a bronchial catarrh and then a tuberculous peribronchitis, with closure of the lumen either by pressure, actual growth, inspissated mucus, or all three. The node finally protruded into the bronchus causing a plugging with the subsequent atelectasis.

A similar growth may occasionally protrude into the pulmonary veins and produce a generalized miliary tuberculosis. It may also rupture into the mediastinum, into the pleural cavity, or through the esophagus. Extensions in the bronchi, however, are much more common.

When a late hematogenous dissemination results from any of these modes of spread, there are two principal types that are not only distinct in the mode of origin, but in the clinical end-results. They first become disseminated throughout the lungs and may not extend beyond them. Most of these originate from a lymphatic type of spread that involves the lesser circulation, through the thoracic duct and left subclavian vein. The other type involves the pulmonary veins which disseminate bacilli to the whole body. The former may be symptomless even though the x-ray may reveal showers of tubercles throughout the lung. The latter is usually more severe and commonly assumes the "typhoid" syndrome. Tubercles of this generalized type are usually most numerous in the lungs, second in numbers in the spleen, then they are found in order in the lymph nodes, liver, adrenals, kidneys, bone, meninges and rarely in the muscles. When they involve the meninges of the brain, there is the usual terminal meningitis.

In less severe cases of generalization, isolated foci may appear and ultimately become manifest as the various extrapulmonary forms of disease.

There is nothing constant, however, in bacterial hematogenous dissemination. Apart from the more constant "hematogenous phase" of the primary, bacteremia in tuberculosis usually appears in showers of different degrees of severity, depending upon the penetration of a capillary or larger blood vessel or the progression through the lymphatics long after the hematogenous phase of the primary.

Instead of an immediate progression, primary tuberculous lesions may undergo gradual retrogression either with or without depositing daughter colonies locally or in the lymphatics. They may become quiescent for months, or even years. Finally some of them or their slowly growing daughter tubercles may produce a result similar to those described for more rapidly progressive lesions. The slow progress of some tuberculous lesions is not yet sufficiently appreciated.

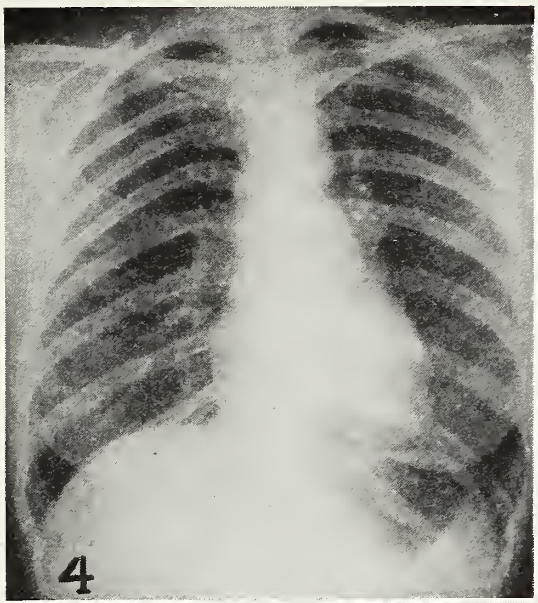


Fig. 4. Case 3. Roentgenogram taken November 8, 1938. Note density in left hilum.

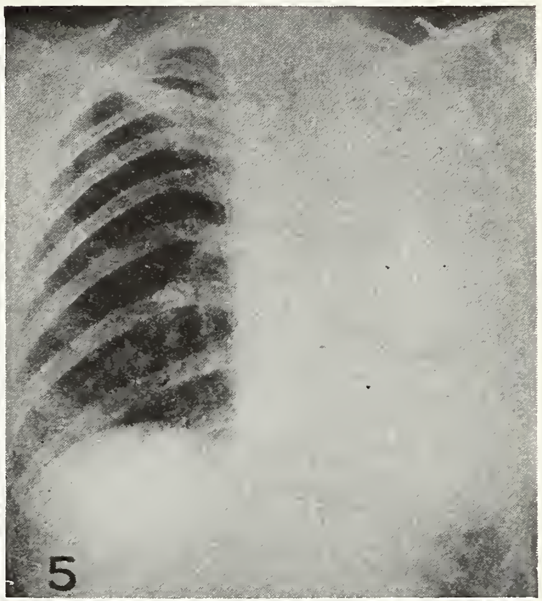


Fig. 5. Case 3. January 3, 1939—Atelectasis of left lung. (Note the heart is pulled out of sight.)

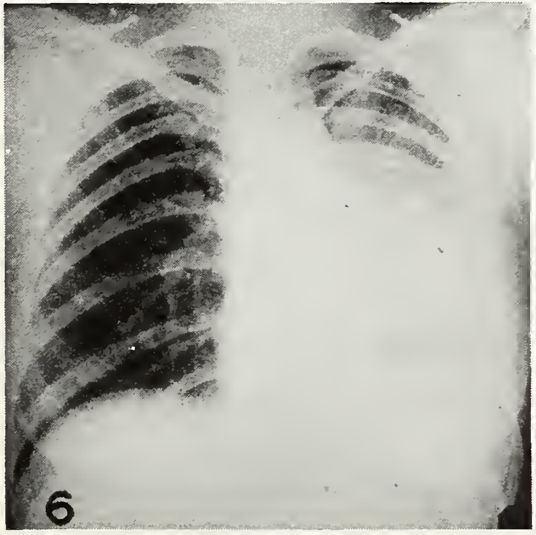


Fig. 6. Case 3. January 17, 1939—Clearing.

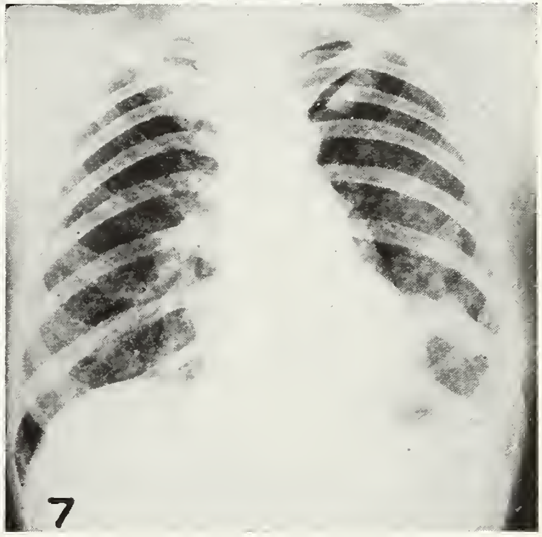


Fig. 7. Case 3. April 18, 1939—Practically all cleared within about four months' time from onset.

Exogenous Infections

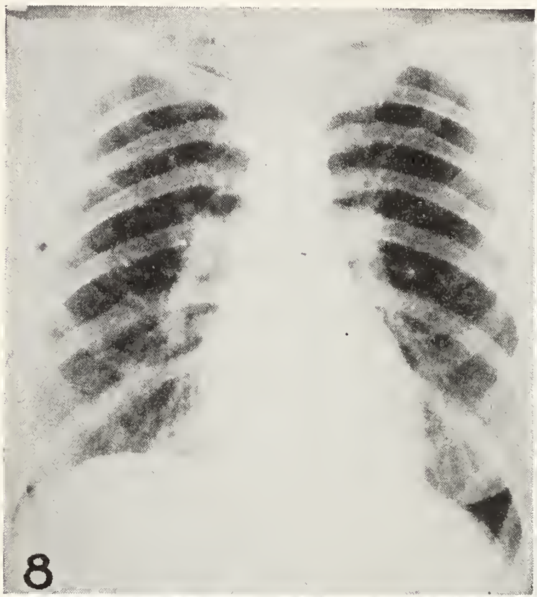
Under the heading of exogenous infections, there are two distinct modes that should be recognized. The first is the possible infection that may occur on top of another older smouldering process. This has been properly termed a superinfection. It is difficult to detect such infections with certainty, because of the difficulty in determining when an earlier infection exists. It is also difficult to determine the increase in the threshold of infectability caused by the existing infection.

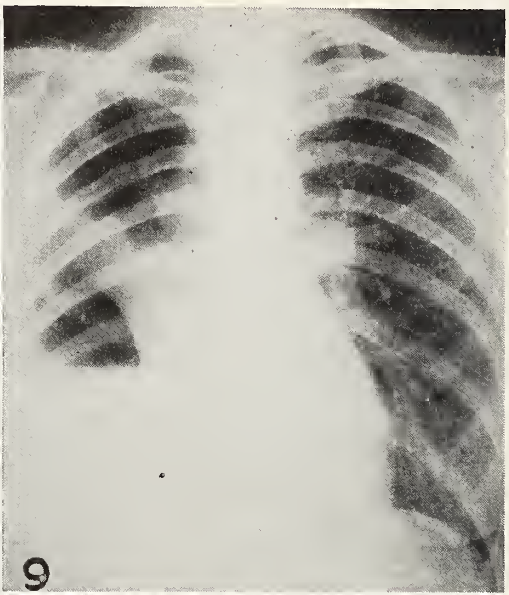
The other type is a true reinfection, occurring on a completely healed process. Although it is practically impossible to distinguish between these two types, they will be considered together in the discussion on the development of the disease from them.

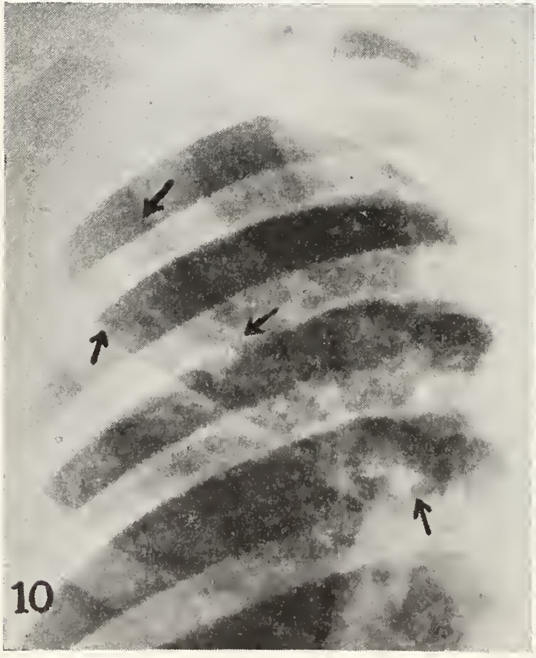
The parenchymal disease in these types usually begins in the posterior and upper aspects of the lung, most commonly along the subapical bronchi, less commonly in the apex, the horizontal rami, or in the apex of the lower lobes. When the process begins in the apices there is a tendency for the disease to be more benign in character.

Minimal Lesions

The size of the lesions at first may be microscopic, but, irrespective of the size at the beginning, the upper limit of size of a minimal disease has been defined by the tuberculosis associations. The first x-ray appearance may be in the form of tiny flecks barely visible. Undoubtedly the disease is present for some time before it shows even on the x-ray. They are observed more commonly in the first and second interspaces, with a slightly less common occurrence in the apex. If the Mantoux is first negative and turns positive, it is probably a primary infection in an adult. Without the Mantoux this distinction cannot be made, and with a positive Mantoux it may be the late phase of a primary. There are many more than ordinarily suspected. Several of these have been shown in a recent work where autopsies were performed.







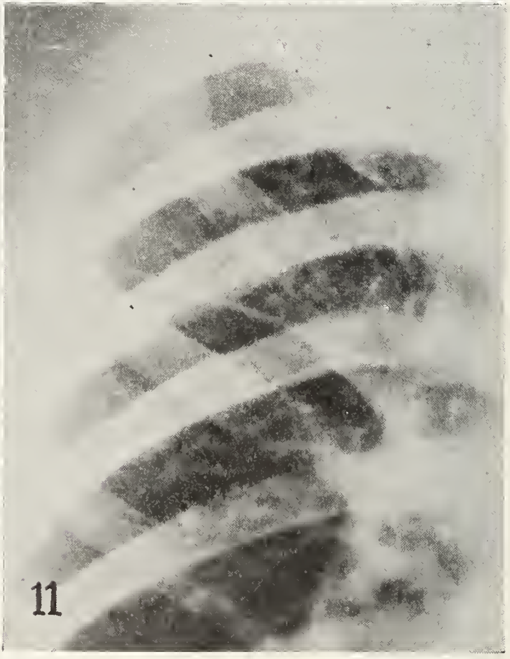


Fig. 8. Case 4. Roentgenogram of normal chest taken April 16, 1936.
Fig. 9. Case 4. April 1, 1939—Advanced disease, pneumothorax and effusion.
Figs. 10 and 11. Roentgenograms taken between Figures 8 and 9 reveal the development of the disease in the same case.
Fig. 10. Case 4. Sept. 2, 1937—Note minimal lesion in second right interspace, and calcified lesions at hilum.
Fig. 11. Case 4. February 23, 1938—Moderately advanced lesion in right upper.

Case 4 illustrates a small beginning that developed into a grave advanced lymph node type.

Case 4.—P. J. S. was a twenty-seven-year-old nurse who had a difficult service in a large tuberculosis sanitarium and at one time cared for an ill mother at night in addition. The x-ray studies reveal the changes that took place in her chest. At first there were a few tiny flecks in the right first intercostal space, then an increase in their size and number, and finally a positive sputum. Rest and a gain of twenty pounds in weight did little good because the disease continued to progress. A pneumothorax was advised and given. The third picture showed a tiny cavity appearing and a moderately advanced lesion. She seemed to improve and was allowed to marry. The pneumothorax was continued and she seemed to be doing well. After a trip to Florida, however, she returned with a pleurisy and effusion and temperature from 99 to 103. The last x-ray (Fig. 9) is shown revealing the advanced conditions at present. The sputum and pleural fluid are positive for tubercle bacilli. She expectorated about 75 c.c. of glairy mucopurulent sputum at first, but this later became more purulent.

Comment.—This seems to be a progressive process, perhaps starting as a primary, as a small lesion in the parenchyma, and progressing to an ulcerative lesion with what appears to be a severe involvement of the lymph nodes around the hilum causing effusion, cough, mucoid sputum and dyspnea. Later the sputum changed to a more purulent type, apparently after the bronchi became more caseous and the mucous glands became impaired by the toxicity. This case passed through the moderately advanced to the far advanced stage.

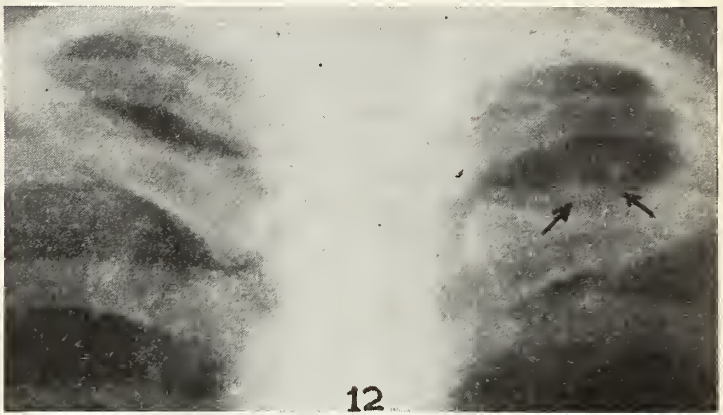
As the lesion becomes older the flecks may become encapsulated. At no time does the minimal lesion itself produce any grave systemic symptoms.

In the late stage these flecks may spread to smaller infiltrates, but usually they become encapsulated and heal, leaving behind some form of calcified focus. Some of these forms may have been included by Puhl, Simon and Stefko, in the foci bearing their names.

Moderately Advanced Lesions

In the moderately advanced disease the first signs are infiltrates of varying sizes, most of which are extensions from minimal lesions. They may have perifocal flecks and may extend over several rib interspaces on the x-ray picture. There may or may not be clinical symptoms.

Some of these infiltrates may go on to ulceration and produce a peribronchitis involving the hilum lymph nodes, and there may be a condition similar to what has been described under the previous headings of a sequel to a primary infection. In the late phases of this stage of disease there may be an extension to fibrocaseous and ulcerative disease that passes into far advanced type. Nodular, miliary, acinous-nodose tubercles, and round infiltrates may follow these various lesions. *As the disease progresses further, there is a tendency for the lesions to appear in bronchi in the anterior part of the lung.*



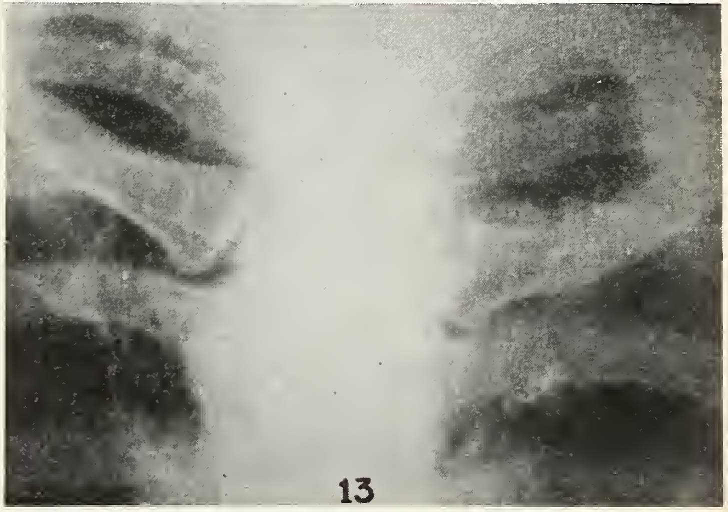


Fig. 12. Case 5. Roentgenogram taken June 9, 1926. Note small cavity in left apex with two small calcified lesions.
Fig. 13. Case 5. March 2, 1938—A quiescent fibroid lesion in both apices—more in left.

Without any signs to indicate it, these lesions may go on to healing, produce fibroid cavities, clearing acinous-nodose and nodular lesions, and leave behind an emphysematous residue in the parenchyma and dilatation of the bronchi as a bronchiectasis. One such case will be cited.

Case 5 illustrates a moderately advanced lesion healing spontaneously or at least advancing very slowly.

Case 5.—C. H. was an assistant housekeeper in a large tuberculosis hospital for twenty-four years. She was about forty-five years old, with no complaints at any time referable to the lungs. There was a routine x-ray taken in 1926 (Fig. 12) revealing a small cavity in the left apex with two calcified lesions in the wall and one or more small calcified lesion towards the hilum. There was also a slight spread to the right apex. The lesion was perhaps an adult primary six to ten years old. It must have been six years old to show the amount of calcium present, and it probably was acquired on duty and would not have been over twelve years old, more probably not over ten. The x-ray (Fig. 13) taken twelve years later (and about twenty years after infection) revealed a slight spread of the disease, but it was definitely more fibroid and, barring accidents, was on its way to a spontaneous healing.

Comment.—This appears to be a small apical adult primary infection, spreading slowly to a fibrocaseous, fibrocalcareous and fibroid disease over a period of more than twenty years. At no time were there clinical symptoms, and it is likely that no clinical disease ever will result if the patient lives her usual life.

Far Advanced Lesions

Last, there is the far advanced stage which has the same phases as the others, except there is a greater involvement from the beginning. The infiltrates may be massive, involving the larger part of the lobe; may be pneumonic, involving one, two or more lobes; and there may be an extension to the lower lobes. It may also result from a slow progression of minimal and moderately advanced lesions, as in Case 4.

As the disease becomes more chronic many months to years after the onset, the lesions may become more fibrotic; cavities which have formed may develop dense walls and even disappear. There may be an equilibrium established between the host and the disease which lasts from years to decades. *Like the moderately advanced lesions, as the disease progresses, the lesions become progressively caudalward and anterior.* This is the type that has filled most of our sanitarium beds in the past.

The late period of this far-advanced stage may be a terminal process that is manifest by an extension to the bases and an involvement of practically all the good lung tissue. "Gravity" infiltrates may form along the ends of the lower lobe bronchus that resemble clusters of grapes. Lobal patches of caseous bronchopneumonia may appear in the lingula or in the other marginal aspects of the lung. Sometimes a caseous pneumonia will involve one of the lower lobes. Extensive fibrosis will be found around the older cavities with marked contraction.

On the other hand, even these advanced stages may heal, leaving behind fibroid scars in place of cavities or very heavy walls surrounding old cavities with fibroid peribronchitis and fibrous scars in place of what were formerly acinous-nodose and nodular tubercles. In every case, however, where healing takes place, as just described, there is a residue of emphysema that plays a very important rôle. It may be rather diffuse or it may be bullous in character. Irrespective of type it usually cuts down the capillary bed and leaves the patient dyspneic. Extreme cases of this type may go on to right heart failure.

Case 6 illustrates a clinically silent form of tuberculosis going on to a terminal emphysema.

Case 6.—F. H. C. was born in England and came to the United States at the age of eight. There was no tuberculous history. He was a fifty-nine-year-old man at the time of death in December, 1938.

He finished the seventh grade in school and worked as a clerk and railroad passenger agent for thirty-eight years. In 1931 he stopped work on account of ill health, which dated back to 1928.

His past history revealed that he had gonorrhea in 1920 with stricture, and syphilis in 1922, which was treated one year and pronounced cured. He had a fistulectomy in 1926 at the Mayo Clinic for a fistula "of twenty years' duration." His onset was with cough in 1929, but he had not been well for some time. The symptoms were; cough for some time, expectoration one ounce in twenty-four hours, slight blood streaking once or twice, loss of ten pounds in weight, and dyspnea for a year.

The physical examination as reported was as follows: "General development fair; general condition fair; skin clear; teeth two plates; fingers clubbed; heart within normal limits; heart sounds first loud systolic and presystolic; murmurs at apex, presystolic thrill; blood pressure 140/76."

Chest examination: "Impaired expansion bilaterally; dullness over upper third bilaterally; right, varied râles and harsh breath sounds; increased whispered voice in upper half; left, similar findings. Diagnosis—pulmonary tuberculosis, far advanced "B"; multiple cavitation bilaterally."

Electrocardiographic report: "Heart rate 110; rhythm irregular due to extrasystoles. QRS 1, 2, 3 slurred. QRS 1 low. ST 2, 3, depressed. Diagnosis—Myocardial damage; auricular premature contractions."

X-ray examination: "Apices are both very hazy. Diaphragms are oblique. Costophrenic angles are both obliterated. Cardiac shadow is enormously enlarged both to the right and left. There is an infiltration of both upper fields, characteristic of tuberculosis, and a definite enlargement of the heart."

The essential laboratory findings revealed 150 mgs. albumin per liter in the urine; a slight shift to the left in the blood picture, and negative Wassermann and Kahn tests in both blood and spinal fluid. All else was essentially negative.

The essential postmortem findings were cyanosis, mild edema of the ankles, a very large heart (weight 415 gms.), with a right ventricle measuring 9 mm. in thickness. The left ventricular wall measured 13 mm. The musculature was soft and pale yellow-brown.

The analysis of the postmortem x-ray of the lung was as follows: There were scattered calcifications in both upper lobes up to 6 mm. The bronchopulmonary nodes showed calcifications up to 4 mm. There was a fibroid 3 cm. cavity in the left upper and scattered acinous-nodose and patchy pneumonic foci throughout both lungs. There were extremely large bullæ along the diaphragmatic and anterior margins reaching the size of 10 cm. The tracheal cartilages were calcified.

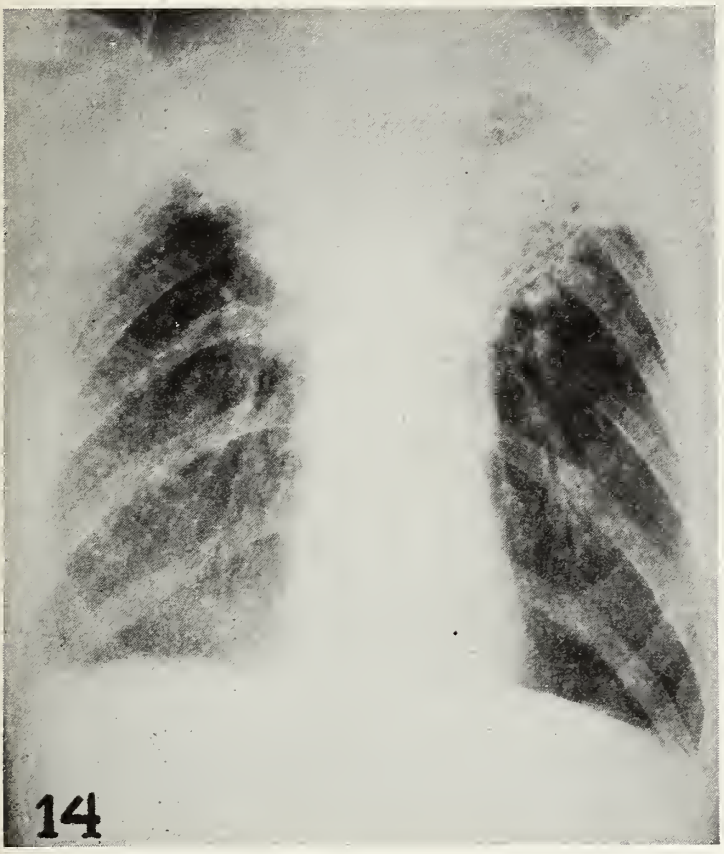


Fig. 14. Case 7. Roentgenogram showing fibroid uppers, emphysematous bases.

This case represents an emphysema of healing as well as a marked marginal emphysema due to effort.

Comment.—The date of origin of the tuberculosis is not known, but must have been before 1906, the approximate date of the beginning of his fistula, which presumably was tuberculous. The calcifications and fibroid lungs also point to a disease of twenty or more years duration.

The probability is that the infection was a young adult or childhood type that was essentially symptomless throughout life, but gradually progressed and resulted in a fibroid upper part of his lungs with a gradual developing emphysema in the lower parts. This caused an extra burden on the right heart and resulted in the myocardial hypertrophy and damage.

Case 7 was a disease advancing throughout life with dyspnea the first significant recognized symptom.

Case 7.—W. H. was a sixty-year-old American painter and decorator of Irish ancestry. The patient was nine years old when his mother died of pulmonary tuberculosis after two years of illness. He was perhaps infected when about five to seven years of age, or fifty-three to fifty-five years before death. He worked hard all his life, drank heavily, and raised eleven children. He had pneumonia (tuberculous?) at thirteen, twenty-six, and forty-two years of age. At twenty he had a pulmonary hemorrhage, diagnosed as "asthma." At fifty-five he had a severe pulmonary hemorrhage and began to raise sputum in which the health department found tubercle bacilli. He came into the sanitarium as a result of loss of weight (twenty pounds), weakness and dyspnea.

The clinical examination revealed "an emaciated old man, with a slightly barrel-shaped chest. He breathed with the accessory muscles of respiration. On percussion there was hyperresonance below and dullness in the upper part of the chest. Auscultation revealed absent breath sounds, prolonged expiration with wheezes and ronchi, moist râles in the anterior part of the chest, and whispered pectoriloquy in the apexes."

The x-ray revealed multiple fibroid cavities in both uppers with a retraction upwards and a marked emphysema in both bases. The heart was enlarged.

The sputum was positive, although many such cases become negative, years and even decades before death.

Extrapulmonary Tuberculosis

The extrapulmonary localizations may be in the form of miliary spread, as mentioned before, coming in the wake of the primary or as a later "accident." It may involve the pleura, mucous surface of the bronchi, trachea, larynx, and gastrointestinal tract by direct extension. The genito-urinary tract may be involved by foci borne by the blood stream, also the various other extrapulmonary foci including the spleen, kidney, liver, adrenal, bone, skin, meninges, et cetera.

Atypical Phenomena

There is included in this classification a special group of cases that are markedly controversial as to cause and clinical findings. Without wishing to complicate the literature, I have used the term *paratuberculosis,* although it has been used before in another sense. These are the forms of the disease that I believe may be explained on the basis of a filtrable or atypical form of the germ. These phenomena are perhaps associated with the many cases of classical tuberculosis, but in their pure forms they are relatively rare. I believe we may consider part of the cases of polyserositis, Pick's cirrhosis and erythematous lupus belonging here; also Poncet's rheumatism, Per-the's disease and perhaps Schaumann-Besnier-Boeck's syndrome, and certain types of erythema nodosum, and disseminated follicular lupus.

Complications and Sequelæ

Another grouping includes those cases that may be considered as complications and sequelæ such as pulmonary hemorrhage, fatty and amyloid changes in the parenchymatous organs, emphysema, bronchiectasis, et cetera (Cases 6 and 7 illustrate emphysema).

Associated or Concomitant Diseases

Finally, we may consider diseases associated with tuberculosis but not related to it. Although they may play no rôle as a cause of the disease, yet they must be reckoned with when present. Such diseases are carcinoma of the lung, or, in fact, carcinoma elsewhere in the body, with secondary metastasis to the lung; diabetes, syphilis, heart disease, kidney disease, and practically every condition known to medical science.

Effect of Immunological Factors on Morphology

After visualizing these many anatomic changes in tuberculosis, some of the fundamental causative factors may be reflected upon in order better to understand the clinical results and to lay a basis for effective therapy and a better public health control. What brings about the various changes described? What brings about clinical symptoms? These factors are not all known, but I believe enough is known to divide them into specific and non-specific types, each of which may be discussed.

The non-specific elements, such as protein split products, toxic amines, etc., result from any tissue destruction and perhaps enter into most disease processes. Whatever they may be they injure the normal body cells, causing a deranged metabolism; lead to nausea, loss of appetite and then loss of weight; interfere with the heat regulating mechanism, causing a rise in body temperature; irritate the neurogenic heart centers, increasing the pulse rate; in fact, the whole normal mechanism is deranged so that an abnormal physiology is the result. These may be termed *general* or *systemic* effects, in contrast to local effects which result from any intercurrent episode such as effusion, hemorrhage, ulceration, etc.

There is demonstrable evidence of specific effect in the form of tuberculin reaction and humoral or cellular elements to neutralize it. There has also been shown a decrease in allergy or a desensitization due to a gradual increase in antigen.

The attempts to correlate tubercle information, cytology and pathological reactions with allergy, however, have heretofore met with failure or have become controversial, but there is undoubtedly a relationship. In the primary lesion there is a different reaction than in the late stages of the disease. But whether the "secondary" tuberculous process is a regular function of the allergy-immunity complex is still obscure. There is much to support it. The complex of allergy and immunity varies greatly with age, race and even in individuals. Some day it may be linked up with the changing cytology of the disease. In slow forming tubercles or in people with low allergy, or in a desensitized lung, the tubercles seem to resemble more the primary type of lesions. On the other hand the rapidly forming types resemble abscesses.

One of the interesting anomalies of tuberculosis and one that has in the past, and still does, offer grave obstacles to control, is the fact that there is no consistent relation between clinical symptoms and morbid anatomy. Extensive disease may be present without symptoms sufficiently severe to send the patient to a doctor or for the doctor to find it without any x-ray picture or careful laboratory studies. So light are symptoms in some cases that a considerable percentage become spontaneously healed and are never found unless an autopsy is performed.

Whatever may cause this disparity cannot be given for the very good reason that it is not known, but there must be some relation, however, to the absorption of toxins.

It seems logical that there is either a walling-off of the toxins or a neutralization of them, or both acting together in symptomless disease. The toxic substances do not seem to reach the vital centers in quantities sufficient to cause a derangement of normal physiology. In such cases, the cavities expel mostly all their toxins with the sputum. Only a slight amount of absorption takes place from the heavy granulation tissue around the cavity well. There may be just enough to increase the destruction of old polymorphs and to increase the young cells, to change the colloid stability of the blood and increase the rate of fall of red blood cells; but not enough to raise the body temperature, increase the pulse rate or lead to a perceptible loss of weight. As a consequence there may be only a slight leukocytosis or a slight "shift to the left," or a slight increase in red cell sedimentation, as the only indication of disease.

An infiltrate or a cluster of tubercles may be so well encapsulated that the same result occurs, although there may be a slow "leaking" of bacilli through the capsule that, over the years, may spread and ultimately result in active disease.

Importance of Dosage

What is of supreme importance, however, in the disease as a whole, seems to be the *size of the dosage of bacilli at the beginning of the infection, and the subsequent multiplication of them in the bodies of the infected patients.*

All rules seem to be suspended when huge doses occur for the first time. Violent acute inflammation results rapidly. The sheer quantity of material overbalances all natural defense processes. Excesses of nature's own cells, living and dying, aggravate the process. At first it is non-specific and independent of allergy, but as allergy appears later the untoward effect is multiplied. Large dosage either with or without allergy seems, therefore, to be the main cause of the "abscess" type of tubercle and rapid progression.

While a mild allergy itself may assist in protection, it seems to be on the whole a trouble maker so far as spreading the disease is concerned. Above all, it should not be looked upon as a synonym for immunity, for the two are in certain respects separate mechanisms. This is apparent when a loss of allergy may occur either artificially or during the course of the disease, yet resistance is maintained. It does seem to be largely responsible for the changing character of the tubercle from the epithelioid-fibroid type to the polymorph-lymphocyte-abscess type. The resulting disease would appear to be much of a function of this interesting relationship.

Variations of Parasites and Its Relation to Pathology

A word may also be said about the tubercle bacillus and its variants and the bearing they may have on human disease. This offers a new "frontier" in the tuberculosis problem. There are variations of the tubercle bacillus that produce unusual pathological effects. There seems to be good evidence that very small or even filtrable forms may play a rôle in the disease.

The course and change of the germ in the body is still only vaguely known. Acid-fast bacilli rarely grow abundantly in the tissues. On the other hand, in freshly opened up cavities, they will not infrequently grow in masses, and in such cases patients are not only a menace to themselves, but to everybody around them.

The Relation to Public Health

This brings in the public health aspect as related to the pathology and bacteriology. Like clinical findings, there is little relationship of the extent of pathology to the numbers of bacilli. They depend usually upon an ulcer or cavity.

The most important factor for the public is, therefore, the presence of *sputum that is positive for tubercle bacilli.* The next in importance is the *number of bacilli present per cubic centimeter of sputum.* They usually vary in proportion to the amount of surface of recently excavated caseous lesions. The fresh caseum seems to act as a culture medium in which bacilli sometimes grow in masses. The third important feature is the ability of the bacilli to grow in the tissues. This may be quite properly termed *virulence.* The causes of the growing of bacilli in tissues, with their non-specific and specific effects, however, are still unexplored frontiers in tuberculosis.

Not all positive cases, however, are of significance so far as the public health is concerned. Tumescent lymph nodes may allow bacilli to "leak" through into bronchi for three or four years after a primary lesion has been healing, and bronchial ulcers may expel bacilli. In such cases there is little sputum, and the germs may only be detected on stomach lavage or bronchial swabbing. The bacilli in such a case are, therefore, important to the individual but not to the public health.

Before closing, something should be said about the relationship of these many phenomena to therapy. The object of a rational therapy in addition to the time-honored food and rest, should be first a system of prophylaxis by removal of the open and occult sources of bacilli. In vulnerable young people it may be expedient to protect by vaccination. In known cases of tuberculosis, treatment should aim to decrease the growth of bacilli in the body by a neutralization of the toxins, both specific and non-specific, and to increase encapsulation. Finally, it should aim to cut down the amount of sputum. These objectives are best accomplished by rest, a balanced diet and wherever possible the use of collapse therapy measures.

In conclusion, I wish to emphasize that the rather terse declarations in this thesis may appear as unwarranted dogmatism, but it is a well attested fact that practically all of the assertions made regarding essential principles, represent classical studies of a vast number of workers. Reference to all these would be prohibitive and really inexpedient in this type of presentation, intended as it is for ready reference of medical men in general practice. It should be pointed out, however, that a better understanding of the new aspects of the problems has been greatly facilitated by a meticulous study of over 1,200 autopsies on our service at the Chicago Municipal Tuberculosis Sanitarium. The classification presented is not to be construed as anything to be used at once, or, for that matter, ever to be used. It is only intended as a temporary framework around which the facts concerning this complex disease may be "draped," the better to understand the disease myself and perchance to help convey that understanding to others.

THE TREATMENT OF VAGINAL DISCHARGES*

E. D. PLASS, M.D.

Iowa City, Iowa

ABNORMAL vaginal discharge of a non-sanguinous nature is one of the most common gynecologic complaints and yet it is probably treated more inadequately generally than any other similar symptom. Recent advances in the study of leukorrhea have elucidated many etiologic problems and have made possible more intelligent and more effective treatment. The application of this new information to the actual therapy of the condition demands the utilization of certain simple bacteriologic procedures and has made ordinary symptomatic treatment archaic. There are admittedly many gaps in our knowledge, but this does not condone failure to use the data that are available. In the time available, I shall attempt to emphasize those facts of physiology and pathology which are best established and most useful.

Under completely normal conditions the vaginal discharge is sufficient only to keep the walls of the canal moist. The fluid portion of the discharge presumably represents the minimal secretion from the cervical glands, to which are added masses of epithelial cells desquamated from the mucosa and aggregations of the vaginal bacilli. The mucous membrane itself possesses no glandular elements and consequently is generally said to have no secretion, although it is probable that a small amount of fluid may diffuse through the mucosa and provide the necessary moisture. In any event, individuals who have been subjected to total hysterectomy rarely complain of unusual vaginal dryness even though there can be no cervical secretion. The vaginal bacilli of Dœderlein react upon the glucose and glycogen provided by the epithelial cells to produce lactic acid, which maintains a considerable acidity in the discharge and largely prevents the growth and development of pathogenic organisms.

There is considerable excellent evidence that the vaginal mucosa and the cervical glands are under the control of the female sex hormone. In the absence of this estrogenic stimulation, the mucous membrane becomes thin and easily traumatized, the vaginal bacilli become less plentiful or disappear and the acidity is reduced—conditions which favor the development of an abnormal flora and predispose to infection with pathogenic organisms. The cervical glands likewise are stimulated to growth and activity by estrone, and regress when deprived of its effect.

The amount of the vaginal discharge may occasionally be increased by physiologic stimuli and may cause some concern to the woman. The most common instance of such an increase occurs as a result of sexual excitement, when there appears to be a greater output by the cervical glands and the vulvo-vaginal glands of Bartholin contribute their mucous secretion at the introitus. It is also well recognized that many healthy women are conscious of a premenstrual increase in the discharge which is probably best explained by assuming a hormonal stimulation of the cervical glands, together with pelvic hyperemia, since it is unassociated with any apparent abnormality. Finally, the leukorrhea of early pregnancy, which may appear so abruptly and be so profuse as to suggest an acute gonorrhea, is also best explained on an hormonal basis. In such instances, the absence of pathologic findings should suggest the proper diagnosis and should serve as a basis for reassuring the patient, but only after thorough examination for other factors has been negative. It is not wise to assume that a leukorrhea is physiologic merely from the fact that its appearance coincides with the period when such discharges are known to occur.

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*Read before the annual meeting of the Minnesota State Medical Association, Minneapolis, June 1, 1939.

The clinical study of any patient with leukorrhea should follow a well organized plan and it should be remembered that the discovery of a single etiologic factor does not necessarily remove the possibility that other pathogenic agents may be present. A careful history will elicit information about the time relationship to the menses, which may be important, and will determine whether the discharge is irritating during any portion of the cycle. In suspected gonorrhea, a history of possible exposure is obviously significant, and in the case of children the questioning should include the various details of family life which might give a clue as to the source of the infection. In adults, a pelvic bimanual examination should be carried out to detect gross genital disease, and the cervix should be inspected carefully through a speculum with satisfactory exposure and adequate illumination. Finally, bacteriologic examinations with smears or spreads, hanging drop preparations, and cultures should be done, in an effort to determine the most probable etiologic factor. It is generally recognized that leukorrhea usually originates in the lower genital tract, including the cervix, and that uterine and tubal discharges are relatively very uncommon except in malignant disease. The older concept of chronic endometritis is untenable in view of our modern knowledge.

Chronic cervicitis, undoubtedly the most common cause of leukorrhea, presents various manifestations, which to some extent dictate the form of treatment. Under this classification, it is usual to include the erosions and the eversions, and possibly the cervical polyps.

Cervical erosion is generally looked upon as an evidence of infection, although there are some investigators who believe that there is an underlying hormonal factor, since it may appear in virginal women or in young girls with no stigmata of bacterial invasion. On inspection, the cervical portio presents a greater or lesser absence of the usual covering stratified squamous epithelium. The cervix appears fiery red and the red area, which is sharply defined from the vaginal mucosa, does not stain with iodine. In non-infected individuals, the surface is smooth or slightly granular, while in those with true endocervicitis enlarged nabothian follicles may protrude from the surface. The eroded area, which is covered with cylindrical epithelium or has no epithelial covering, usually bleeds slightly on contact and there may be a history of spotting following douching or coitus. When the erosion is of the so-called "congenital" type, it is doubtful whether any of the usual methods of therapy are effective. On the other hand, erosions resulting from infection can be treated by applications of strong silver nitrate solution (25 per cent) or by brushing the surface gently with a cautery and by puncturing the visible follicles. In some instances, it is necessary also to cauterize the cervical canal, but ordinarily surface treatments will suffice. Healing is accomplished by stimulating the growth of the stratified mucosa up to the external os, a development which necessarily takes time, and may require a series of light cauterizations at intervals of a month or more. Patience will usually avoid the necessity for deep burning or for surgical intervention. As healing occurs, the discharge usually lessens, and it is difficult to persuade the patients to continue treatment until the lesion is completely cured.

Cervical eversions occur in women who have had cervical tears, either from an obstetric episode or from surgical dilation of the cervix. The cylindrical epithelium of the canal thus becomes exposed and is more susceptible to bacterial invasion. In the milder cases, silver nitrate applications or surface cauterization will promote the growth of squamous epithelium down to the new os, but when the lesion is more extensive it may be necessary to do a cervical amputation, a trachelorrhaphy, or a conization. Generally, the cautery will provide some relief, and there are many who believe that the surgical attack should be postponed until the conclusion of childbearing.

Cervical polyps produce leukorrhea, which is commonly associated with "spotting," but in some cases there is no bleeding. The lesion is easily diagnosed by inspection, when the bright red polyp is seen protruding from the os. Such polyps are generally benign and may be removed by severing the pedicle with the cautery or scissors, or by twisting it off. When patency of the os suggests that there may be other similar growths higher up in the canal, and especially in older women, it may be advisable to perform curettage and to have the material subjected to histologic examination.

As a rule, the leukorrhea associated with cervical lesions does not produce irritation unless there is a complicating vaginitis, due to the invasion of certain specific organisms of which three—the gonococcus, trichomonad, and monilia—are of special importance. Occasionally, the type of discharge and the history suggest the causative agent but in the final analysis the diagnosis must be made by microscopic or bacteriologic examination. Gonorrhea is suggested by the sudden onset with a profuse purulent discharge, by urinary urgency and frequency, and by apparent involvement of Skene's or Bartholin's glands. In trichomonas infections, the discharge tends to be yellow, limpid, and frothy, and symptoms are aggravated in the post-menstrual period. Monilia are more apt to produce premenstrual irritation, the discharge tends to be thick and white, and thrush-like patches may be visible on the mucosa. In general, however, it is dangerous to rely on such observations, particularly because mixed infections are relatively common and because any type of vaginitis may closely simulate the others.

Gonorrhea may be diagnosed by stained smears or, preferably, spreads, which reduce the risk that the cocci will be extruded from the leukocytes. Simple methylene blue staining may suggest the proper diagnosis, but only a well made Gram preparation will be conclusive. The biscuit-shaped organisms must be intra-cellular if the diagnosis of gonorrhea is to be made. Within the past few years, cultural technics have been developed which are much more sensitive than stained preparations. In doubtful cases, this diagnostic procedure should be employed even though it entails sending the patient to a properly equipped laboratory. The gonococcus is so sensitive that cultures must be incubated almost immediately at the proper temperature.

In adults, gonorrheal vaginitis is only a transient and insignificant part of the clinical picture, and consequently need not be treated for itself. Lower tract gonorrhea as a composite entity is, however, very important because of its tendency to involve the internal genital organs by direct extension, and demands the best and most logical therapy available. The older practice of employing douches and topical applications in the hope of killing off the gonococci by direct exposure has been largely abandoned, because it apparently does more harm than good. Reliance is now placed on rest, local cleanliness, and the administration of members of the sulfanilamide group of drugs. It appears that the results are not so good as in the male, but that they are better than previously.

In contrast to the situation in adults, gonorrhea in prepubertal girls and in postmenopausal women frequently produces a true vaginitis and rarely invades the upper genitalia or the vulvovaginal glands. It is generally agreed that the susceptibility of the vaginal mucosa in these age groups is associated with changes in this membrane incident to the absence of stimulation by the estrogenic hormone. At birth the mucosa, which has had the intrauterine benefit of transplacental estrone, is adult in character and so immune to gonococcal infection that gonococci introduced during birth are unable to gain a foothold. Within a few weeks this immunity disappears with the thinning of the mucosa and the decrease in the acidity of the discharge. Practically the same situation develops after the menopause, and evidently for the same reason. In both age groups, the mucosa becomes easily infected by various organisms, including particularly the gonococcus. Irrespective of the infecting agent, modern therapy includes the administration of the estrogenic hormone in an attempt to increase local tissue resistance. In young girls, the gonococcus is the chief offender, while in postmenopausal women other organisms are more commonly involved.

In either instance, treatment consists in simple local cleanliness, and the administration of the hormone either intramuscularly in oil or preferably in the form of vaginal suppositories. Under this stimulus, the mucosa assumes an adult character and eventually becomes so resistant that the organisms die from lack of proper environment. Care must be enjoined in carrying out such treatment, so that other structures under control of the hormone, particularly the breasts and uterus, are not stimulated too much. The dosage of the hormone will, of course, vary with the size and age of the patient, but very large doses are to be avoided. Uterine bleeding and undue enlargement of the breasts indicate reduction in the dosage or the temporary discontinuance of treatment. It has also been argued that the administration of rather large doses of Vitamin A is both logical and useful, especially in senile vaginitis of any variety, since this accessory food factor plays a rôle in epithelial growth. In gonococcal infections, it is also advisable to give sulfanilamide, although its effectiveness in this condition has not been conclusively shown.

The *trichomonas vaginalis* is known to be associated with irritative vaginal infections, but its etiologic significance is not yet clear. There are some investigators who still believe that it produces the vaginitis, whereas the majority agree that it is probably a secondary invader without etiologic significance. Attempts to solve this problem have so far been ineffectual because of the extreme difficulty in obtaining the organism in pure culture, a feat which has not yet been accomplished in spite of persistent efforts. In the meantime, other organisms, especially the streptococcus subacidus, have been assigned the etiologic rôle, but these findings have been disputed to the point where the whole question is still quite unsettled. In any event, women with this infestation, who present irritative symptoms, must be treated in spite of the existing scientific uncertainty. Many individuals harbor the organisms without symptoms, a fact which further complicates the situation.

The diagnosis of vaginal trichomoniasis can be made by examination of the fresh discharge or by culture. For the former, some of the material adherent to the vaginal wall is suspended in normal salt solution on a cover-slip and placed on a hollow-ground slide. The trichomonads, which are somewhat larger than leukocytes but smaller than epithelial cells, are detected by their motility, which is apparently preserved throughout their life. The cultural technics that are available are rather difficult and uncertain, but in the hands of those with experience frequently detect organisms missed on examination of the fresh material. It is, however, doubtful whether such mild infestations are usually associated with symptoms. It should be kept in mind that the trichomonads do not stain easily and cannot be found in ordinary smears or spreads.

Apparently, trichomonads are never present in discharges which show a normal vaginal flora—other organisms than the Dœderlein bacilli are invariably present. Because of this fact some observers believe that the associated bacteria actually produce the symptoms, and consequently direct their treatment at alterations in the flora, in the hope that the reëstablishment of normal conditions will make the medium so unfavorable that the parasites will perish. The trichomonads cannot survive at the normal vaginal pH, but find conditions increasingly favorable as neutrality is approached—a circumstance which also affects the contaminating bacteria in similar fashion. The vaginal acidity may be increased by frequent douches with a mild acid solution—lactic acid or acetic acid in the form of vinegar. In addition, a sugar, dextrose or lactose, can be introduced to encourage the growth of the vaginal bacilli which remain. Attempts at actual inoculation of pure cultures of the vaginal bacilli have not been very successful, even though the maneuver has much to recommend it.

The alternate and more popular methods of treatment aim at destroying the trichomonads and the organisms living in symbiosis with them. Various therapeutic agents have enjoyed temporary reputations but none has proved uniformly successful, since there is nothing specific in their application. At present insufflations of silver picrate or of devegan powder are in vogue, and appear to be better than the simpler antiseptics and dyes formerly employed.

Finally, Hibbard and Falls have introduced a form of serologic therapy based upon their belief that the streptococcus subacidus is responsible for the symptoms of the infestation. The general immunity to this organism is raised by subcutaneous injections of increasing amounts of a vaccine and supplemented by local applications of a filtrate of streptococcus subacidus cultures in broth to the vagina. The originators of the method claim excellent therapeutic results, which independent observers have been unable to duplicate. Moreover, there is still considerable disagreement concerning the identity and the etiologic significance of the streptococcus subacidus.

It can, perhaps, be said that this method of treatment is still *sub judice,* but that further work along this line may develop a truly useful and valuable procedure.

The source of the original infection and the factors which occasionally make it so resistant to treatment are yet unsolved. It is well known that trichomonads are frequent and harmless invaders of the mouth and lower gastro-intestinal tract, and, in men, of the genitourinary organs, especially the prostate and seminal vesicles. Considerable investigation has been undertaken to correlate these facts with observed vaginal infestations, but the relationship is still not clear. It has been emphasized that the vaginal organisms are slightly different morphologically from those observed in other foci, and it has been suggested that these structural changes may be induced by alterations in environment. In any event, the possibility remains that certain patients may appear refractory to therapy, when the continuance of the disease is actually occasioned by repeated reinfections from their own hollow viscera or from sexual contacts. Such possibilities should be borne in mind whenever therapeutic refractoriness is observed, and should direct attention to certain obvious details of personal hygiene.

The *monilia,* a simple yeast form, has more recently been accepted as a definite etiologic factor in certain cases of vaginitis, which may occur at practically any age, but is more common during sexual maturity and especially during pregnancy. It is also undoubtedly the cause of diabetic pruritus vulvæ, although this revised concept has not yet completely replaced the older orthodox belief that the sugar-laden urine is irritating in itself. The monilia thrive best in an acid medium and consequently are most likely to produce symptoms in the pre-menstrual period. They may, like the other so-called specific organisms, be harmless invaders, or they may produce the most severe vaginal irritation that is observed clinically. Those who harbor the yeasts may experience repeated attacks of vaginitis over long intervals.

The monilia can be easily obtained in pure culture, and human inoculation experiments have demonstrated that they actually produce the irritation with which they are associated. It is, however, not yet clear why some women may harbor them for years without symptoms. Attempts to explain these vagaries on an allergic basis have not been eminently successful, although there is some evidence that certain individuals may have a developed sensitivity. Allergic skin tests have not generally correlated with clinical findings.

Yeast vaginitis may be suspected when the discharge is flecked with small white particles or when white flakes of the growing fungus are detected on the vaginal mucosa in thrush-like patches. The actual diagnosis must, however, be made from stained smears or from cultures. The monilia stain easily with the usual bacteriologic dyes and are very Gram-positive. In such preparations they appear as dark homogeneous oval forms, the conidia, or as granular threads, the mycelia, which may be seen to branch. Occasionally, these structures may be detected in fresh unstained material, when the conidia appear as small highly refractile particles and mycelia as definite threads. Nevertheless, it is always advisable to resort to culture for the final diagnosis. The monilia grow abundantly on slants of Sabouraud's agar, the pH of which is adjusted to 5.0, even at room temperature. This facility of growth permits cultures to be sent to a laboratory at any distance in any season of the year. The growth under such conditions is usually so luxuriant that other organisms are overgrown and the monilia is obtained easily in pure culture. There are undoubtedly many pathogenic types of the fungus, but for practical purposes their differentiation is not essential.

The treatment of monilia vaginitis is usually simple, with prompt relief of symptoms and with complete eradication of the organism, but occasionally is more difficult and time-consuming. In the usual case, the topical application of gentian violet, either in 2 per cent aqueous solution or in the form of suppositories, will be effective, but in rare instances it will be irritating or quite ineffective, and some other therapeutic agent will be required. Especially in these cases, the combination of potassium iodide and potassium iodate, suggested by Hesseltine, will be useful, and may be employed effectively in any patient with vaginal moniliasis. Alkaline douches may also be employed. Resistant infections occurring during pregnancy are ordinarily relieved by delivery, while those developing in diabetics respond to control of the diabetes with the elimination of the attendant glycosuria.

The active treatment of monilia infections of the vagina during pregnancy is dictated both for the relief of irritation and as a prophylaxis against oral thrush in the newborn. It is well established that many cases of thrush represent birth canal infections, the monilia gaining access to the mouth during parturition. The condition is likewise effectively treated with gentian violet in 1 to 2 per cent aqueous solution.

Undoubtedly, there are many other organisms which are, at least occasionally, responsible for vaginitis, but which have not been recognized as etiologic factors, and for the detection of which, simple laboratory methods have not been devised. It is also probable that they too, like those mentioned, may be present without producing symptoms. This condition, the so-called carrier state, represents one of the present enigmas, that apparently will not be solved until more is known about the physiology of the vagina and its discharge. The occurrence of asymptomatic infections inevitably invokes questions of reduced virulence or of increased local immunity, since either deviation would suffice to explain the clinical anomaly. In gonococcus infections, the evidence points to decreased virulence of the particular strain, whereas in moniliasis the resistance factor is probably involved. In addition, and possibly most important, there is the factor of changing conditions of acidity, of glucose or glycogen deposit, and of the amount of moisture, which may alter the adequacy of the discharge as a medium and thus alter the flora. In prepubertal girls and in post-menopausal women, these factors seem to be under the control of the ovarian hormones, a fact which suggests the possible influence of ovarian products even during the period of sexual maturity and activity.

In conclusion, and from the purely practical standpoint, certain facts must be emphasized.

1. No patient with vaginitis should be treated blindly until after every effort has been made to identify the causative organism by such methods as have been described.

2. After the diagnosis has been made, active therapy should be started according to the preference of the physician, and should be altered if, after fair trial, there is no improvement.

3. The possibility of reinfection must be kept in mind.

4. The patient must be warned to protect others in her family from those infections which are easily transmitted and serious, such as gonorrhea.

5. It must be remembered that mixed infections occur, and that not infrequently an endocervicitis may be responsible for the persistence of leukorrhea even after the specific organisms have been eliminated.

PLACENTA ACCRETA

J. C. FEULING, M.D.
Bovey, Minnesota

PLACENTA accreta is a condition in which the placenta becomes firmly adherent to the uterine wall due to a defective or absent decidua basalis. In this manner, the uterine muscle is exposed to the erosive action of the tropho-blast with a penetration of the muscular wall by the villi. Due to this firm union, the normal mechanism of placental separation is prevented. For normal separation of the placenta, the normal decidual basalis is necessary. After the fetus is expelled, the uterus shrinks in size and thus reduces the size of the placental site. This process causes the placenta to peel off and the formation of small hematomas helps to hasten the separation. The separation occurs in the layer of the decidua basalis which is spongy and easily torn.

Placenta accreta is an extremely rare condition but very definite when one is found. Polak[3] reports that this condition happens in about 1 in every 6,000 deliveries. Kraul[2] reports three cases in 60,000 deliveries in a period of twenty-three years in Vienna. King,[1] in 1938, checked over the literature and found a total of 109 reported cases. From these and numerous other reports the incidence is about one in 20,000 deliveries. Multipara and primipara are about equally affected.

Etiology.—Inasmuch as placenta accreta is due to an absence of, or pathological condition of, the decidua basalis, one must naturally look for the cause of this irregularity to determine the cause of the firmly adherent placenta. This atrophy may be produced by a too vigorous curettement, or an atrophic endometritis, or a thinning of the endometrium covering a submucous myoma. If the placenta be attached in one of the uterine cornua where the mucosa is thin, one may have a firmly adherent placenta resulting. A mal-functioning corpus luteum must be considered since it is from this structure that the decidua is developed. Finally, in some cases the syncytial cells have more power of erosion and penetration than normal and will penetrate deeply into the uterine wall.

Histologically, the chorion frondosum consists of a connective tissue layer which lies next to the amnion and a layer of villi which are covered by an outer layer of tropho-blastic cells.[4] As each villus goes into the basil decidua which protects the muscular layer, it makes a space by erosion of the mucosa. This space is always larger than the villus which allows a blood space to be formed which is filled with maternal blood. However, villi near the margin of the placenta penetrate more deeply into the uterine wall, thus fastening the two structures together at the periphery. These are known as anchoring villi. However, these are small in number compared to the total of the placental villi and are easily torn off by the contractions of the uterus. In placenta accreta, the uertine wall is extremely thin with a majority of villi perforating into and many even through the muscle.

Microscopically, the basil decidua is either extremely thin or absent and syncytial cells may be demonstrated between the groups of muscle fibers.

Diagnosis.—Placenta accreta must be differentiated from (a) retained separated placenta, (b) simple adhesion of the placenta.

In a retained separated placenta, the normal signs are present, namely, uterine bleeding, descent of the cord, and globular firm uterus. By waiting or attempting the Crede method of separation, this placenta can be expelled. In the simple adhesion, there is no bleeding and none of the other signs are present. The last named, placenta accreta, can only be differentiated by an attempted manual removal. Various authors give the required waiting time at from forty-five minutes to two hours, if there is no excessive bleeding.

In simple adhesion of the placenta, the examining fingers, when introduced into the uterine cavity, readily demonstrate a line of adhesion between the uterine wall and the placenta. This can easily be broken down and the placenta delivered with a minimum amount of trauma. In placenta accreta, no line of adhesion can be found and the placenta cannot be torn loose from the uterine wall. Due to the thinness of the uterine muscles, too forceful an attempt at extraction often results in a perforation of the uterus or severe hemorrhage due to torn muscle fibers or an inversion of the uterus. During any vigorous attempt at removal with placental forceps, small fragments may be torn loose which will result in hemorrhage of various proportions depending upon the size of the placental sinus opened.

Prognosis.—The few cases reported have made the explanation of mortality unreliable. However, in the cases reviewed, a mortality rate of 66.6 per cent was found, due to sepsis, hemorrhage, perforation of the uterus or a combination of these.

Treatment—When a retained placenta is encountered, and none of the usual signs of separation have shown themselves, one must be suspicious of placenta accreta. If it be a simple adhesion of the placenta, removal followed either by packing or ergot is indicated. In placenta accreta, the patient should have immediate supravaginal hysterectomy, since this procedure removes the uterus and the offending placenta and also minimizes danger of infection.

Case History

Mrs. D. E., age 28 years.

Previous history was normal except that two years ago, she had an incomplete abortion at which time she had a curettage done elsewhere. The last normal menstrual period was on April 28, 1938, with an abnormal one-day flow on May 28. Life was felt September 10, 1938. The pregnancy continued normally until February 10, 1939, at which time the patient demonstrated edema, albuminuria, and a rising blood pressure. It was decided to induce labor and the patient was given castor oil and quinine on the morning of February 11. About 10 A. M., the membranes ruptured with a discharge of a liberal quantity of dark blood-stained, very foul smelling fluid. Pains started at approximately 2 P. M., and labor continued until 12:30 A. M. on February 12, when a normal female infant was delivered with low forceps following a lateral episiotomy. Following the expulsion of the fetus, approximately one gallon of this same blood-stained fluid was discharged. This had an extremely foul odor such as putrified blood. At this time, high up on the cord inside the vagina, a cyst the size of an egg was discovered out of which blood was coming. This was thought to be the cause of the blood leakage into the amniotic fluid. In attempting to clamp the cord above the cyst, the cord was cut with the hemostat. The usual method of extraction of the placenta was tried with no results. After about forty-five minutes wait, with some constant bleeding from the cut part of the cord, it was decided to do a manual removal. This was attempted under ether anesthetic but no line of demarcation between the placenta and the uterine wall could be demonstrated. The placenta was grasped with a placental forceps but only small fragments could be removed. Due to the thinness of the uterine wall and the hemorrhage, only two attempts were made. At this time, the intra-uterine fingers could be felt extremely plain from the outside. A mild degree of shock developed so the uterus was packed tightly and the patient observed the remainder of the night. She quickly came out of shock and that same morning, February 12, at about 11:00 A. M., the blood pressure had risen to 120/70, the pulse was 100 and of good quality. The packing was removed and Crede method attempted but the placenta could not be loosened. She was grouped for transfusion and a supra-vaginal hysterectomy was performed with a minimum amount of blood loss. Immediately following, she was given 500 c.c. of blood by indirect transfusion. The following course was entirely uneventful with the exception of some mild infection and some drainage through the abdominal wall. She was allowed to sit up on the twelfth day and home on the fourteenth day. After going home, she developed a severe pleurisy and considerable vaginal discharge which cleared up entirely on the twenty-eighth day. Since then she has been entirely normal and the baby has progressed extremely well.

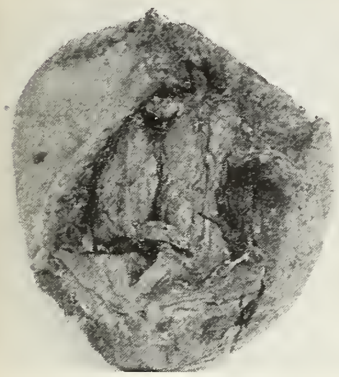

Fig. 1

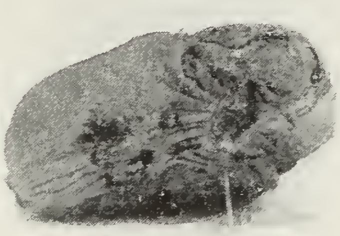

Fig. 2

Figure 1. Uterus with placenta in situ.
Figure 2. End view showing the extreme thinness of the uterine wall.

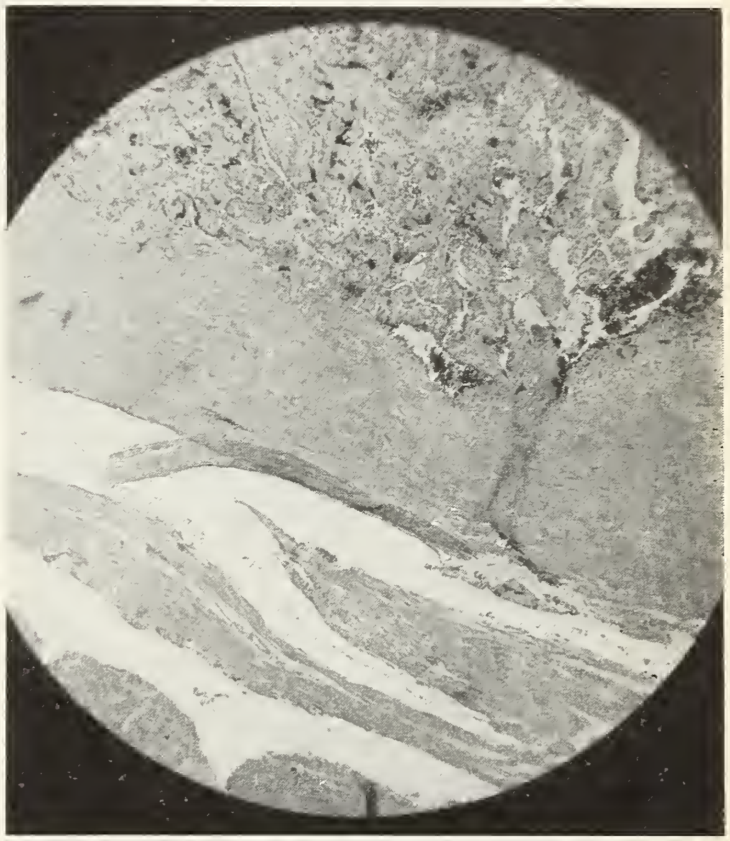

Figure 3. Photo-micrograph showing the villi extending into the muscle wall with numerous syncytial cells throughout the muscle fibers.

Pathological Report.—Uterus weighed 2,600 grams and the placenta was attached in the left cornu region. The uterine wall over the placenta was about 1 centimeter in thickness and in other places the wall was 3-4 centimeters. The placenta could only be separated with difficulty and then sections of the wall were torn out and pieces of the placenta remained adherent. The microscopic report was a very thin decidua with syncytial cells throughout the muscle fibers.

Conclusions

1. Placenta accreta is a definite clinical entity although extremely rare.
2. Its etiology is not known but is thought to be an abnormal basil decidua.
3. Diagnosis is made by the inability to separate a retained placenta.
4. Treatment is immediate supra-vaginal hysterectomy followed by transfusion.

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CEREBRAL CALCIFICATION*

(Parkes Weber-Dimitri Type)

GORDON R. KAMMAN, M.D., F.A.C.P.
Clinical Assistant Professor of Nervous and Mental Diseases, University of Minnesota
Saint Paul, Minnesota

IN VIEW of the frequency with which various forms and types of cerebral calcification are seen on routine roentgenograms of the skull, and in view of the fairly characteristic symptom-complexes which can be produced by pathological cerebral calcification, it is surprising that reports of the condition are not found more frequently in medical literature.

Using Camp's[1] basic outline as a reference, I have made the following classification of cerebral calcification:

- I. Physiologic Calcification
  - A. Pineal Gland
  - B. Choroid Plexus
  - C. Falx Cerebri
  - D. Tentorium
  - E. Meninges
  - F. Pacchionian bodies
- II. Pathologic Calcification
  - A. Neoplastic Group
    - 1. Gliomas
    - 2. Endotheliomas
    - 3. Aneurysms
    - 4. Suprasellar cysts
    - 5. Cholesteatoma
  - B. Non-neoplastic group
    - 1. Vascular
      - a. Aneurysm
      - b. Hematoma
      - c. Arteriosclerosis with calcification
    - 2. Old abscesses
    - 3. Tuberculoma
    - 4. Parasitic cysts
    - 5. Encephalitic lesions
      - a. Acute infections such as epidemic encephalitis and malaria
      - b. Intoxications, *i.e.,* CO poisoning
      - c. Various chronic diseases of the brain such as encephalitis interstitialis infantum (Virchow)
      - d. Cerebral atrophy.
    - 6. Symmetrical calcification
    - 7. Parkes Weber-Dimitri disease
- III. Pseudo-calcification. Deposits simulating calcium in morphology and location, appearing in the brain in three forms (Ostertag)
  - a. Free in tissue as small granules which may become confluent, assuming a mulberry shape.
  - b. In the same form but about the walls of the capillaries, sometimes replacing the capillary wall and obliterating the lumen.
  - c. In the walls of the arteries, appearing as homogeneous or granular masses.

Cerebral calcification may be symmetrical or asymmetrical. Symmetrical calcification is usually found in the basal ganglia and has recently been described by Eaton, Camp and Love.[2] Some authors believe that in this condition we are dealing with pseudo-calcification, but Eaton, et al, proved by chemical analysis in some of their cases that the concretions actually were calcium. Numerous cases have been reported in the literature, and common in all reports are changes in and about the finer cerebral vessels, particularly the lenticular nuclei. According to Eaton, et al, who made a comprehensive review of the literature, most writers described the globules as deeply basophilic staining material lying adjacent to the capillary walls. There is a tendency for the material to coalesce, forming vascular sheaths and concretions. The lumens of the arteries may or may not be constricted. In some cases the dentate nucleus of the cerebellum is involved.

Asymmetrical calcification may occur in any one of the conditions mentioned above under "pathologic calcification." A particularly interesting type is that known as Parkes Weber-Dimitri disease. In this condition, according to Leef[4] the calcifications are unique in that they appear to be tubular and corkscrew-like and seem to follow the outline of the gyri of the brain. At first, the calcifications were thought to be in the blood vessels or in the pia. However, in 1934, Krabbe[3] reported six cases, one of which came to autopsy. Microscopic examination of this material showed that there was no calcification in the pia, but that the deposits were located in the cerebral cortex, mostly in the second and third layers. Furthermore, the calcifications bore no relationship to the blood vessels. The etiology of the condition has not been determined.

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*Read before the Minnesota Academy of Medicine, March 8, 1939.

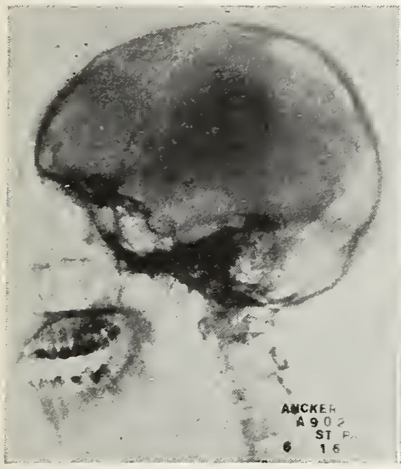

Fig. 1.

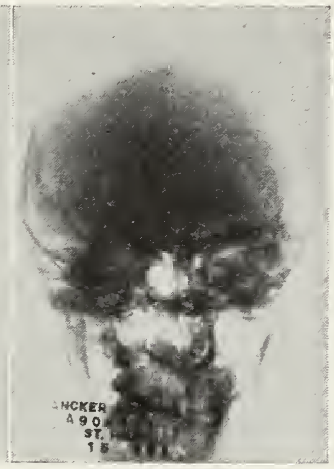

Fig. 2.

Fig. 1. Lateral view of skull showing deposits of calcium. Note corkscrew-like appearance in the approximate region of the middle cerebral artery.

Fig. 2. Anterior-posterior view showing deposits of calcium, especially on right side.

The reason for the tubular appearance of the calcification is that the thin layers of calcium, being below the molecular and outer granular layers of the cerebral cortex, are separated from each other by these layers. Krabbe has reproduced their appearance on the roentgenogram by taking a brain and coating the gyri with silver nitrate. This salt penetrates a short distance into the cortex and gives a tubular corkscrew-like shadow on the roentgenogram.

Both in symmetrical cerebral calcification and in Parkes Webber-Dimitri disease epileptiform seizures and progressive mental deterioration are the most prominent symptoms. Facial nevi, visual field defects, parkinsonism, cerebral atrophy, and choked disc also have been reported.

Case Report

P. H., a single white female twenty-four years of age, was first seen by me in the out-patient department of the Ancker Hospital in Saint Paul on June 2, 1938. The family history showed that the father, mother, one brother and a sister were alive and well. There were no dead siblings and no family tendencies. The patient was the first child, born normally at full term, after the mother had passed through a normal pregnancy. There were no immediate post-natal complications such as cyanosis or convulsion. Dentition began at seven months and, according to the patient's mother, was normal. Walking began at fourteen months and talking at twenty months. The parents stated that patient seemed to be just like other children her age. During infancy and early childhood there were no serious illnesses, operations or accidents except for a slight head injury without unconsciousness.

The patient's educational history showed fairly normal progress. She started school at the age of seven years and finished the twelfth grade at the age of twenty. Her school records showed that she was a "C" student. This is important in view of the reduced intelligence quotient found after her illness had been present for three years.

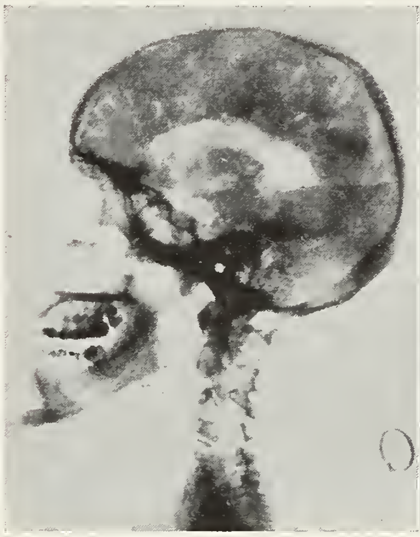

Fig. 3.

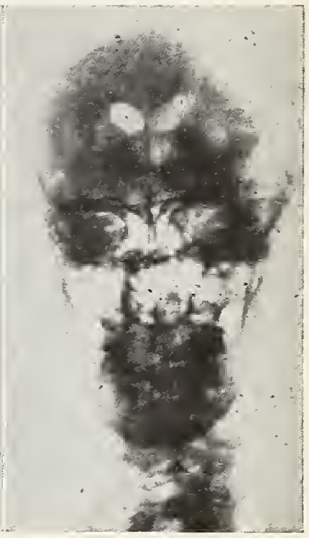

Fig. 4.

Fig. 3. Lateral view of encephalogram after injection of 140 c.c. of air. Note diffuse cortical atrophy, moderate internal hydrocephalus and also the presence of fluid level.

Fig. 4. Anterior-posterior view of encephalogram after injection of 140 c.c. air. (Same as Fig. 3.) Note marked cortical atrophy especially on the right.

Relevant points in the past history were an appendectomy and cholecystectomy in 1933 because of vague abdominal pains. In 1935 the patient was in another hospital where a diagnosis was made of renal lithiasis. However, the stone never was found and the patient was said to have passed it.

The present illness began in 1935 when the patient began to have attacks of petit mal. These were quite typical and continued at irregular intervals for several months. Then grand mal attacks appeared. She would have a psychic aura during which she became momentarily confused. Then she suddenly would lose consciousness and fall to the ground in a generalized convulsion, during which she would chew her tongue and pass her urine. There never were any focal attacks observed. Between the attacks of grand mal, which came on from once a week to once in three weeks, patient would have attacks of severe lancinating pain in various parts of her body and extremities. These pains were colicky in nature and might well lead one to suspect gallbladder or renal colic.

The neurological examination showed the pupils to be dilated, but equal and regular and responding to light and in accommodation. Extraocular movements were normal but there was a divergent squint due to a weakness of the right internal rectus. There was bilateral optic atrophy and examination of the visual fields showed a left homonymous partial hemianopsia. The cranial nerves were otherwise normal. The extremities showed normal muscle volume, tone, strength, and coördination. All tendon and superficial reflexes were present and equal and no pathological reflexes were elicited. Sensation was normal in all modalities.

The blood Wassermann was negative and the cerebrospinal fluid was clear, under normal pressure, contained 4 lymphocytes, .045 gm. protein, 720 mg. chloride per 100 c.c., gave a negative Wassermann reaction, and the colloidal gold curve read 0001110000. Blood calcium was 9.5 mg. and 11.5 mg. per 100 c.c.

The patient was admitted to the hospital for encephalography and further study. Upon entering the hospital she complained bitterly of sharp, lancinating pains throughout her body, arms, and legs. On the second day she developed an acute psychotic episode and mechanical restraint was required. For three days she was noisy, incoherent, and shouted that she was being tortured. The excitement subsided without any special treatment and further studies could be carried out.

The I.Q. (Kuhlman's) was 62 per cent. X-rays of the skull showed characteristic deposits of calcium distributed asymmetrically in the cerebral cortex, principally in the right cerebral hemisphere. One area had a typical tubular corkscrew appearance (Fig. 1).

Encephalography after injection of 135 c.c. of air showed good filling of the ventricular system, including the cortical fluid pathways. The cortical markings on the left half of the brain were less numerous than average, making it necessary to consider the possibility of arachnoiditis on the left side. The ventricles showed about normal size and configuration except for slight enlargement of the left lateral ventricle, especially posteriorly, and displaced to the left. This was associated with considerable contraction of the brain as if due to atrophy. The subdural space was obliterated superiorly over the brain surface on the left. This study suggested left brain atrophy with evidence also of arachnoiditis bilaterally.

After the encephalogram the patient seemed to be much brighter and she complained much less of pain. Two weeks after admission she was discharged from the hospital and followed in the out-patient department, where she has since been reporting once a month. In January, 1939, the grand mal seizures reappeared and were not controlled by the administration of 6 grains of phenobarbital daily. Accordingly she was placed on dilantin, 1½ grains four times a day, and she has been free from seizures since March 23, 1939. Her psychiatric status has not altered. She continues to be dull, irritable, and the parents find her a problem in discipline. Recently she has become intensely erotic and without close supervision probably would become sex delinquent. The optic atrophy has not progressed and the visual fields have not altered.

Comment

The configuration of the calcium deposits as shown by the roentgenogram in this case correspond closely to that described in Parkes Weber-Dimitri disease. The etiology of this condition is unknown, but at least in this patient the condition is an acquired one. With normal birth and developmental history, a fairly normal scholastic record, and the absence of any early personality changes, it is difficult to see how the condition could have been congenital. Whether the cerebral atrophy preceded or followed the process of calcification is impossible to say. It is conceivable that there was at one time an internal hydrocephalus. This could account for the optic atrophy and possibly also the dilated ventricle. The absence of a history of headache does not rule out an early chronic hydrocephalus. I recently saw a case of advanced internal hydrocephalus with bilateral consecutive optic atrophy which at autopsy proved to be due to an enormous pituitary adenoma which had grown up out of the sella encroaching on the floor of the third ventricle. This patient never had complained of headache or any other symptoms of increased intracranial pressure.

It is interesting to note that in this case some of the calcium deposits were in the right parieto-occipital area. Interference with the optic radiations in this region would explain the left homonymous partial hemianopsia.

Summary

1. A working classification of physiological and pathological cerebral calcification is presented.

2. Pathological cerebral calcification frequently results in epileptic convulsions and mental deficiency. Facial nevi, cerebral atrophy, visual field defects, and optic atrophy also may occur.

3. Parkes Weber-Dimitri disease is a peculiar type of cerebral calcification in which the concretions have a characteristic roentgenographic appearance.

4. A case of Parkes Weber-Dimitri disease is reported.

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PARENTERAL ADMINISTRATION OF FLUIDS: PRINCIPLES AND INDICATIONS IN SURGICAL TREATMENT*

MURRAY A. FALCONER, M.B. (N. Z.), F.R.C.S. (Eng.)**
Rochester, Minnesota

MORE and more it is being realized that the successful practice of surgery is dependent, in many instances, on a careful study of the metabolism of the patient in all stages of his illness. Attention must be paid to the requirements of water and electrolytes, especially in cases in which the normal mechanisms of exchange of fluid are interfered with by disease or by surgical procedures. These requirements of water and electrolytes are both quantitative and qualitative, for harm may be done either by inadequate or excessive exhibition of fluids or by the employment of unsuitable solutions. Because the oral and rectal routes of administration of fluid are so often incapable of adequately meeting the needs of surgical patients, particular reference will be made to the parenteral routes and to the solutions which may be given by such routes.

Parenteral administration of fluids, at the present time, is a relatively safe and certain procedure. Its origin and its development have been well outlined by Keith.[27] Thomas Latta[31] may be considered the father of this method of treatment for, in the Edinburgh epidemic of malignant cholera, in 1831 and 1832, he introduced the practice of "the copious injection of aqueous and saline fluid into the veins" of patients in a state of collapse. He did this because the chemists had told him that the blood was deficient in these materials and he found that temporary benefit and even recovery sometimes followed. However, it was not until the World War, when "gum-saline"† solutions were introduced by Bayliss,[3] by Drummond and Taylor,[12] and by Keith[28] that the method found widespread application. The demonstration of pyrogenic substances in certain distilled waters by Seibert[42] led to greater appreciation of the need for meticulous care in the preparation of solutions, whereas the introduction of the method of intraperitoneal injection of saline solutions of Blackfan and Maxcy[5] and of the continuous intravenous "drip" by Matas[33] improved the methods of administration. In the last decade, considerable work has been done on the metabolic requirements of surgical patients, particularly for water and electrolytes, and the composition of the fluids needed to satisfy these requirements has become better understood.

The Requirements for Water

Maddock and Coller[32] have recently written an excellent review of this problem and they point out that an individual, whether healthy or sick, must take sufficient fluid in order to ensure that his body has at least an adequate amount of water with which to carry out the normal physiologic activities. They found that a normal individual, who is not sweating unduly, loses each day 600 to 1500 c.c. of water in the urine, 150 to 200 c.c. in the stools and 1000 to 1500 c.c. in vaporization from the skin and lungs. Thus, 1750 to 3200 c.c. of fluid are required daily in order to maintain a proper water balance. This amount need not all be taken as water to drink because a considerable proportion of it can be derived from the water content of the food and, to a lesser extent, from the combustion of the constituent principles of food. It is estimated that, in this way, a routine maintenance diet will yield 1000 to 1500 c.c. of water daily. Even in starvation 500 c.c. of water become available daily from the materials of the body used for energy.

On the other hand, a sick patient may have requirements for water that are different from those considered adequate for a normal individual and, in estimating the probable amounts required, the nature of his illness must be considered. Among surgical patients, as among normal individuals, the excretion of water serves two main functions: the elimination of waste materials in the urine and the dissipation of heat from the body by sweat and respiration. (The loss of water in the normal stool is insignificant and can be disregarded.) The vaporizing processes have first claim on the available water, whereas the kidneys function with what is left and, therefore, it is necessary that the patient receive sufficient water to enable the kidneys to excrete an adequate amount of urine each day. Lashmet and Newburgh[30] have shown that about 35 gm. of waste material are excreted in the urine daily and that, when the kidney can concentrate urine to a specific gravity of 1.032 to 1.029, this amount may be eliminated in 500 c.c. of urine; whereas, when the kidneys can concentrate urine only to 1.014 or 1.010, nearly 1500 c.c. of urine are required for such elimination. This means that a daily output of 1500 c.c. of urine should be aimed at for the average surgical patient in order to allow a reasonable margin of safety against the retention of waste materials.

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**The author is a University of Otago Fellow on special assignment in the Mayo Foundation from the University of Otago, New Zealand.

†The solution used consisted of 6 per cent acacia in physiologic saline solution.

In assessing the amount of water required for vaporization it must be remembered that, although a normal individual may subsist on an allowance of 1000 to 1500 c.c. daily, surgical patients frequently require more. Patients who have fever and are actively sweating vaporize 1500 to 2500 c.c. daily, whereas patients who have exophthalmic goiter vaporize 1500 to 2000 c.c.[32] Maddock and Coller think that 2000 c.c. of water per day is a safe provision for a surgical patient. This figure together with an allowance of 1500 c.c. of water for urine leads to an estimate of 3500 c.c. for the daily requirements of water for the average surgical patient.

Even this requirement of 3500 c.c. daily is not sufficient in some cases. Maddock and Coller[32] and Bingham[4] have drawn attention to the great loss of fluid from the body which occurs during surgical operations and during the first twenty-four hours afterward. Although the loss of blood which may occur from hemorrhage during the course of routine operations is often greater than the surgeon suspects,[18, 32] much the greatest source of this loss of fluid is through vaporization, which may account for as much as 2600 c.c. of water.[4] Again, in certain conditions of the gastro-intestinal tract, such as vomiting from any cause, intestinal fistula, and severe diarrhea, large quantities of water may be lost in addition to that lost by the usual routes. The harmful effects that follow these abnormal losses may be prevented by the administration of amounts of fluid equal in volume to that of the abnormal amounts lost, in addition to the provisional allowance of 3500 c.c. a day. If this is not done, serious symptoms of dehydration will ensue when water equal in amount to 6 per cent of the body weight has been lost from the body[32] and azotemia, acidosis, and oliguria will manifest themselves.

The figures which have been considered apply only to adults; the data that apply to children in this respect are much less certain. However, the rule still holds that water should be given until an adequate daily urinary output is established. Table I indicates the normal urinary output among children, according to Campbell.[7]

TABLE I. AVERAGE OUTPUT OF URINE AMONG CHILDREN IN TWENTY-FOUR HOURS (CAMPBELL)

Age	Output in urine, c.c.
10 days to 2 months	250- 450
2 months to 1 year	400- 500
1 to 3 years	500- 600
3 to 5 years	600- 700
5 to 8 years	650-1000
8 to 16 years	800-1600

Requirements for Electrolytes

Sodium chloride is the principal salt required for the maintenance of normal activity, the body possessing normally 150 to 200 gm.[43] of this salt, of which about 30 gm. are in the blood. There are wide variations in the amounts of sodium chloride that normal subjects can take. It has been shown that the basal requirements are in the neighborhood of 1 to 2 gm. daily,[13] whereas the continued ingestion of more than 30 to 40 gm. daily by normal subjects leads to edema.[2] Among patients who have hypoproteinemia[26] consequent to inanition, to chronic sepsis, and to the wasting diseases, even smaller quantities of salt will lead to retention of fluid. On the whole, a daily intake of 8 to 12 gm., which is the amount present in an average diet, is a satisfactory amount to be given to surgical patients who do not have an initial low concentration of plasma chlorides.

When hypochloremia is present, larger amounts of sodium chloride are necessary. The surgical conditions which frequently lead to this state of metabolic upset are conditions in which there are abnormal losses of[36] the digestive secretions (profuse and persistent vomiting from any cause, prolonged aspiration of the stomach or duodenum, high intestinal fistulæ, and severe diarrhea), peritonitis,[38] and severe burns;[10] rarely does sweating alone lead to depletion of salt in surgical conditions because the concentration of sodium chloride of sweat is low (0.2 per cent).[35] Salt depletion as the result of abnormal losses of chloride in the gastro-intestinal secretions may be prevented by the administration of physiologic saline solution in amounts equal to the volume of the secretions lost. The concentration of sodium chloride in the digestive secretions rarely exceeds 0.6 per cent and therefore loss of chloride by this route is amply covered by physiologic saline. Lyall and I[13] have shown that, if hypochloremia should develop, sodium chloride is required in amounts of 15 to 25 gm. for each 100 mg. the plasma chloride level is below normal. The normal concentration of plasma chloride is 540 to 620 mg. per 100 c.c. Care should be taken that not too much salt is given lest edema of the lungs and extremities results.

Osterberg,[15] Bargen and I have recently drawn attention to the need for salts of potassium and calcium in small quantities as well as sodium chloride. We pointed out that the requirements for these salts are probably amply met by the provision of Ringer's solution instead of plain saline solutions. Ringer's solution has the additional advantage that it is less likely to lead to edema and retention of water[15, 32] than plain saline solutions.

In many surgical conditions, interference with the acid-base equilibrium occurs. Many excellent reviews of this problem have appeared, among which may be mentioned those of Van Slyke[48] and Hartmann.[21] Alkalosis may be attributable to increased "alkali reserve," as following the ingestion of large quantities of alkali by susceptible patients during the alkaline treatment of peptic ulcer or, more frequently, to loss of chloride ions as in cases of severe vomiting and high intestinal fistula. The former condition will clear up following the cessation of administration of alkali and the provision of an adequate intake of fluid; the latter condition usually will respond to the administration of saline solutions, the excess sodium ions being excreted in the urine. Very rarely are other measures required. In severe cases of alkalosis, as when the carbon dioxide combining power is more than 100 vols. per cent, calcium may be required to control tetanic manifestations.

Acidosis is a more serious condition than alkalosis and may be caused by a great loss of the bases of the plasma as in cases of severe diarrhea, by the retention of nonvolatile acid ions, such as phosphates and sulfates in cases of renal failure, or by the presence of abnormal acids such as the ketone bodies in cases of diabetic coma, dehydration, and certain cases of intestinal obstruction.[14] Because hypochloremia, dehydration, and ketosis are very frequent accompaniments of acidosis, the standard treatment is the administration of solutions of sodium chloride and d-glucose. In severe cases, as when the carbon dioxide combining power is less than 30 vols. per cent, solutions containing alkaline salts are required in addition.

Requirements for Nutrient Materials

Solutions of d-glucose (dextrose) can be used with advantage to combat ketosis and to spare body protein. One thousand cubic centimeters of a 5 per cent solution of d-glucose can be taken intravenously in an hour without sugar appearing in the urine.[49] However, such solutions cannot be used with practicability to provide all the energy required by the body, which, in the case of a man weighing 70 kg., is about 2100 calories daily and which theoretically would require that a 10 per cent solution of d-glucose be given parenterally in amounts of about 5000 c.c. for its satisfaction. Therefore, if a patient is in urgent need of nourishment, but cannot take any or sufficient food by mouth, feeding by gastric or duodenal intubation, by gastrostomy or by jejunostomy should be considered.

Solutions Available for Parenteral Administration

The following solutions have received recognition in parenteral fluid therapy.

Solutions of sodium chloride.—Sodium chloride is used in varying concentrations. Physiologic saline varies from 0.85 to 0.90 per cent (isotonic) although, clinically, 1 per cent solutions are often considered in this category. Hypertonic solutions of 10 to 30 per cent are used intravenously as dehydrating agents and for stimulation of the bowel, whereas solutions of 3 to 5 per cent are used by some authorities for the rapid correction of hypochloremia.

Solutions of d-glucose.—These solutions are used either in isotonic (5 per cent) or in hypertonic (10 per cent) concentration, depending on requirements for energy and the degree of dehydration present. Solutions of d-glucose (dextrose) and sodium chloride are often combined and probably a 5 per cent solution of d-glucose in physiologic saline is the solution most widely used in North America.[9]

Modified solutions of sodium chloride.—Ringer's solution. An isotonic solution would contain sodium chloride 0.8 per cent, potassium chloride 0.05 per cent and calcium chloride 0.03 per cent. Hartmann[22] recommended a hypotonic solution of sodium chloride, 0.60 per cent; potassium chloride, 0.04 per cent; calcium chloride, 0.02 per cent and magnesium chloride, 0.02 per cent. Both of these solutions are improved by combination with a 5 per cent solution of d-glucose.[24]

Hartmann's solution.—Hartmann recommended the following formula: sodium chloride, 0.60 per cent; potassium chloride, 0.04 per cent; calcium chloride, 0.02 per cent; magnesium chloride, 0.02 per cent; and sodium lactate, 0.30 per cent.

Solutions of acacia.—The solution customarily used contains 6 per cent acacia in physiologic saline (gum saline).

Solutions of sodium lactate and sodium bicarbonate.—Isotonic solutions of sodium lactate (1.8 per cent) or sodium bicarbonate (1.3 per cent) are used intravenously in the treatment of severe acidosis. Sodium bicarbonate is also used in 5 per cent solution.

Solutions of ammonium chloride.—Ammonium chloride in a concentration of 0.5 per cent may be used occasionally in the treatment of alkalosis.

Hartmann[22] and Thompson[47] have given instructions for the preparation of these solutions. In the prevention of untoward reactions following intravenous infusion, Thompson[47] and Rademaker[39] stressed the importance of using pure chemical and pyrogen-free distilled water, which can be obtained by triple distillation, by the use of a baffle plate still, or by filtration through a 200 second Zsigmondy filter.[8] Only tubing made of pure gum rubber and hard nonsoluble glassware should be allowed in the apparatus used in the administration of solutions and these should be thoroughly boiled and cleansed before initial use.

Routes of Administration

Fluids may be given by three different parenteral routes, namely the intravenous, the subcutaneous and the intraperitoneal routes. The use of each of these routes has its advocates. The administration of fluids by one or more of these routes is indicated whenever the patient is unable to ingest and absorb sufficient fluid by mouth to satisfy his immediate requirements. Although rectal administration gives satisfactory results when small quantities are indicated and for short periods, the parenteral routes have great advantages when large quantities are required either rapidly or over a long period of time. The factors governing the choice of method in the individual case may be summed up as follows: For the administration of large quantities of isotonic solution, any one of the three parenteral routes may be used. Saline solutions usually can be administered satisfactorily into the loose tissues of the axilla, the outer aspects of the thigh and under the breast in quantities of 2,000 to 3,000 c.c. daily. After a few days, however, these routes become unbearably painful. Among infants, the intraperitoneal route, as introduced by Blackfan and Maxcy,[5] is on the whole satisfactory, although, according to Ravenel, it is not entirely free from risk.[40] The intravenous route, popularized by Matas, with the intravenous drip[33] is satisfactory for all solutions, isotonic and hypertonic; but very strict care must be taken in the preparation of the apparatus and solutions in order to prevent the occurrence of a reaction. Special solutions, such as those containing acacia, sodium bicarbonate, sodium lactate, and ammonium chloride, should be given only by the intravenous route.

Recently, it has been shown, both clinically[17,45] and experimentally,[41] that the continuous intravenous "drip" as usually practiced may lead to the occurrence of pulmonary embolism secondary to thrombosis set up in the irritated vein. This has given rise to the "intermittent drip" as suggested by Friedrich and Buchaly.[17] Fluids are given by drip for short periods only, about 1,000 to 2,000 c.c. being given at the rate of a litre in one or two hours, and additional quantities, if required, being given later in the day. Isotonic solutions alone are employed and a different vein is selected each time, the fluid being infused by a needle and not by a cannula tied into a vein. With reasonable skill it is possible to introduce a needle into a vein of the leg or arm, after a preliminary cutaneous wheal has been raised with novocain at the site of puncture. If the veins, at first sight, appear collapsed, they usually can be dilated by the application of hot packs to the limb for about twenty minutes.

I shall now discuss the indications for use of the various solutions. Excellent papers on this subject have been furnished by Keith,[27] Hartmann,[22] Stewart[44] and Nadler.[36]

Indications for the Administration of Solutions of Saline and/or d-Glucose Parenterally

The administration of fluids parenterally is indicated whenever the patient is unable to satisfy adequately his immediate requirements for fluid by ingestion, or by enterostomy, if such already has been established. When large quantities of fluid must be given, infusions administered parenterally are preferable to infusions administered rectally because of the greater certainty of their absorption and utilization. The extent of their use is governed by two considerations: (1) the state of the daily water balance as determined by a carefully kept chart contrasting the total daily intake and output of fluids, and (2) the state of the electrolytes of the blood as shown by determinations of the plasma chlorides (normal 540 to 620 mg. per 100 c.c. of plasma), the carbon dioxide combining power of the plasma (normal 55 to 65 volumes per cent of plasma) and blood urea (normal 20 to 35 mg. per 100 c.c. of blood) made, at least, on each alternate day.

The first thing to be considered is the requirement for water. As mentioned earlier, the average surgical patient requires an intake of about 3,500 c.c. daily in order to insure an adequate urinary output of about 1,500 c.c. of urine; a patient suffering from established dehydration or abnormal losses of fluid may require 5,000 c.c. or even more. On the chart attention should be paid to the amount of urine passed each day and to the difference between the total intake of fluid and the total output of fluid. The key to the correction of dehydration is the presence of an adequate output of urine and this is a signal for cutting the intake of fluid down to maintenance levels. Once an adequate urinary output has been established, a difference of more than 1,500 to 2,000 c.c. between the total intake of fluid and the total output of fluid signifies retention of water and steps should be taken to restrict the intake. Edema, however, is more the result of retention of salt than of excessive intake of fluid[32] and the patient should be examined daily for its earliest manifestations.

Cabot and Iber[6] have pointed out that a surgeon who is quick to recognize the signs of dehydration when a patient is seen for the first time may be slow to recognize the same signs if a patient is being seen every day, especially if the patient is receiving apparently a good supply of water, but actually is becoming dehydrated because of abnormal losses of fluid. The resulting poor output of urine is attributed erroneously to a reflex or toxic suppression of renal function, whereas the real fact is that the patient has not been given sufficient water for the formation of urine. If the fluid balance had been carefully charted, such a state of affairs would not have materialized.

As long as the concentration of plasma chloride is normal (540 to 620 mg. per 100 c.c. of plasma), sodium chloride should not be given in amounts larger than 6 to 10 gm. daily unless there is an abnormal loss of gastro-intestinal secretions as in vomiting, gastric aspiration, intestinal fistula, or diarrhea, when additional physiologic saline in amounts equal to the abnormal volume of fluid lost should be given (the average concentration of sodium chloride in the various gastro-intestinal secretions is about 0.5 to 0.6 per cent). An intake of larger amounts of salt invites the occurrence of retention of water and edema. The salt required may be given as physiologic saline or Ringer's solution with or without d-glucose and, if additional fluid is then needed, a 5 per cent solution of d-glucose may be given. If hypochloremia is present, additional amounts of a solution of sodium chloride are indicated. Many workers have advocated the use of 3 to 5 per cent solutions, but Lyall and I[14] are of the opinion that better results follow the use of physiologic solutions which incidentally correct and do not aggravate the dehydration. We have shown that, roughly, 15 to 25 gm. of sodium chloride are required to raise the lowered concentration of plasma chloride 100 mg. per cent. It is significant that Orr,[37] who, in association with Haden,[19] introduced the use of very large quantities (1 gm. per kilogram of the patient's body weight on the first day) of sodium chloride in the treatment of intestinal obstruction, has, since that time, modified his views because such treatment produces a tendency toward edema.[37]

Recently Osterberg, Bargen and I[15] have drawn attention to the needs of the body for small quantities of calcium and potassium in addition to sodium. We reported three cases of intestinal obstruction in which the additional administration of salts containing these metals was of value and we favor the routine use of Ringer's solution in preference to solutions of sodium chloride.

When saline solutions are being given intravenously, it is well to combine d-glucose in 5 per cent solution in order to prevent ketosis and to spare the proteins of the body.

Indications for the Administration of Solutions of Acacia and Saline

The use of acacia (5 per cent in Locke's solution) was first introduced in 1917 by Hurwitz in the United States[25] and by members of the Special Investigative Committee of the Medical Research Council[3,12,28] (6 per cent acacia in physiologic saline solution) for the treatment of cases of surgical shock. One of the principal features of this condition is a diminution in the volume of the circulating blood. In the production of this diminished volume, the principal factor known appears to be a reduction in the total volume of the plasma, the result of permeation of plasma-like fluids through the vascular walls.[20,28,34] As a result, actual reduction of the total volume of the blood occurs simultaneously with an increase in the concentration of the cellular elements of the blood. In cases which end fatally, death results from circulatory failure brought about by the presence of an insufficient amount of circulating blood.

One of the principal objectives of the treatment of shock, therefore, is to restore the volume of the circulating blood in order to maintain the circulation. The most direct method is to increase the volume of the blood by the intravenous administration of fluids. Transfusions of blood have been tried and found satisfactory, but unless the patient has had an extensive hemorrhage previously or is anemic, transfusions are unnecessary because what the patient requires is fluid to increase the volume of blood, not corpuscles, of which he already has an ample supply. Theoretically, transfusion of blood plasma would be the ideal method of therapy. Although several workers have considered its advantages, few appear to have tried it. Filatov and Kartasevskij[16] have reported the successful transfusion of plasma in amounts of 300 to 350 c.c. in two cases of shock. They used blood plasma of group AB (universal recipient), which does not agglutinate the red cells of any other blood group, so that preliminary blood grouping of their patients was not necessary. Amberson[1] has pointed out in a review of the problem of substitutes for blood that plasma is to be preferred to serum because of the formation, in the latter, of vasodilator and constrictor substances produced in the act of clotting.

Acacia in physiologic saline solution is an effective substitute for blood plasma[1] and is probably still the most useful agent that we possess for the treatment of surgical shock. The presence of acacia (6 per cent) in the solution raises the colloidal osmotic pressure to a level equivalent to that of plasma, thereby preventing the rapid elimination of electrolytes and water from the circulating blood by excretion through the kidney and permeation through the capillary walls which occurs when simple saline solutions are used alone. In conditions of shock, the solution of acacia and saline should be given slowly by intravenous drip in amounts of 500 to 1,000 c.c. Zunz and Govaerts[50] have shown that, when shock is present, too rapid administration of blood or fluids intravenously may cause the circulation to falter.

The majority of workers have found the intravenous administration of acacia (6 per cent) in physiologic saline solution to be a relatively safe and satisfactory procedure. A solution of acacia is apparently innocuous when introduced into the blood stream, passes within a short time into the tissues and is slowly mobilized and excreted in the urine. Keith, Power and Wakefield[29] have demonstrated its presence in the blood of patients three years after administration without any apparent detrimental effects having been manifested. The repeated daily administration of large amounts of acacia in saline solution, as advocated by Hartmann and his associates[23] in the treatment of nephrotic edema may lead, in some cases, to hepatic damage, but in the amounts used in the treatment of shock, this scarcely seems possible.[1] The recent warning of Studdiford[46] as to this possibility would seem to be the result of the use of solutions which had not been properly prepared.

Indications for the Administration of Solutions of Sodium Bicarbonate and/or Sodium Lactate

These solutions are used in the correction of severe degrees of acidosis such as are encountered in severe cases of diarrhea, dehydration, diabetic coma and renal failure. As mentioned earlier, in cases of minor degrees of acidosis, chief reliance should be placed on the administration of solutions of saline and d-glucose to correct dehydration, supply electrolytes and combat ketosis. Hartmann's solution may be used instead and has the advantage that it contains sodium lactate in small quantities. On the other hand, when serious degrees of acidosis are present, as when the carbon dioxide combining power of the plasma is less than 35 vols. per cent, more concentrated solutions of sodium bicarbonate or sodium lactate are used. Sodium bicarbonate may be used in 5 per cent solution intravenously, 5 to 10 c.c. per kilogram of body weight being given.[22,44] Isotonic solutions of sodium bicarbonate (1.3 per cent) or sodium lactate (1.8 per cent) are preferable and are given in amounts of 10 to 20 c.c. per kilogram of body weight. Van Slyke gives an excellent line table[48] by which the probable amounts required may be estimated. I have found it very important to control the administration of these solutions by frequently determining the carbon dioxide combining power of the plasma, because sometimes a condition of acidosis changes readily to that of alkalosis.

Indications for the Administration of Solutions of ammonium chloride

The majority of conditions of alkalosis associated with azotemia and hypochloremia will clear up following the correction of the hypochloremia by means of administration of solutions of sodium chloride or Ringer's solution. Although it may take some time for the concentration of plasma chloride to become normal, I have not seen harm follow operation in cases in which the carbon dioxide combining power of the plasma was in the region of 80 vols. per cent at the time of operation, provided that the values for blood urea and plasma chloride were within normal limits. In the usual case[11] in which the carbon dioxide combining power of the plasma remains in the region of 100 vols. per cent in spite of treatment along accepted lines, injections of ammonium chloride (0.5 per cent) in amounts up to 1,000 c.c. may be given. The administration should be controlled by determining the carbon dioxide combining power of the plasma frequently.

Summary

Parenteral administration of fluid is now a well established, safe and convenient method of introducing water and electrolytes into the body. It is indicated whenever the patient is unable adequately to satisfy his immediate requirements for these substances by ingestion through the natural channel. However, before it can be used to best advantage, the surgeon must know these immediate requirements and the potentialities of the solutions available to him.

This paper discusses the physiologic requirements of surgical patients for water and electrolytes; it enumerates the solutions available for parenteral use for the satisfaction of these requirements and it outlines the principles on which the use of these solutions is based.

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CARBON MONOXIDE, A PUBLIC HEALTH HAZARD[*]

L. BEN FRANKLIN, M.B.

Minneapolis, Minnesota

CARBON monoxide is a tasteless, almost odorless, colorless, neutral gas with a specific gravity of 0.97. It is practically insoluble in water and has an affinity for hemoglobin of about three hundred times that of oxygen.[19]

Source.—Ordinarily, CO does not appear in nature, but results almost entirely from incomplete oxidation of carboniferous material. The common sources listed in the literature are: the exhaust gases from internal combustion engines, especially motor cars, open fires in furnaces and stoves, leaky gas connections, alcohol stoves, and gas logs.

It has been reported to have been formed in large amounts during severe electrical storms and to have been produced by growing kelp. It is present when buildings burn, is produced in lime, brick, and charcoal kilns, is present following explosions and fires in mines, and is also produced on detonation of high explosives.[19] In the laboratory, it is produced by heating formic acid or oxalic acid with sulphuric acid.[19]

It is found in smoke, and in compartments which have been painted with oil paints and sealed.[20] It has even been reported formed from burning cigarettes.[12]

Coal gas contains about 16 per cent CO; blast furnace stack gas, 28 per cent; mine air after dust explosions, 1 to 8 per cent; and the exhaust from automobile motors about 7 per cent.[20].

Five per cent of the cars tested on the highways by Van Deventer showed a dangerous concentration (0.03 per cent or more) of CO in the air the driver breathed.[10]

Incidence of CO Poisoning.—Carbon monoxide poisoning is probably much more common than most of us realize, especially that of the chronic type. Beck states that "carbon monoxide as a cause of accidental and suicidal deaths in the United States ranks second to automobile accidents."[2] Davis says that it is estimated that there are 50,000 asphyxial deaths in the United States annually and that one-half of these are probably due to CO.[9]

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[*] Prepared for Preventive Medicine and Public Health 101, University of Minnesota, 1939. Author now serving interneship at Queen of The Angels Hospital, Los Angeles, California.

From 1925 to 1935, the various gas companies in the metropolitan area of New York City made 21,143 calls for CO poisoning. All of the patients were unconscious when discovered. Of these, 6,571 deaths resulted, and the remainder were resuscitated.[15]

Tests have shown the blood of an airplane pilot to be 20 per cent saturated with CO.[19]

Symptoms.—Since recognition of carbon monoxide poisoning is practically essential to preventive measures, at least to the realization of the need for them, and since the symptoms are so many and varied, they shall be discussed quite fully. They vary greatly depending on the type of poisoning.

McConnell and Spiller describe three types:

1. Acute—in which death results in a short time or the patient passes into pneumonia, or such conditions as parkinsonism, et cetera.
2. Chronic—causing headache, vertigo, memory defects, and other clinical symptoms.
3. Relapsing—due to injury of certain parts of the body (especially the central nervous system) and leading to symptoms at a later date.[8]

It is generally agreed that all symptoms result from anoxemia. Thus the variation in symptoms in different individuals is probably due to the condition of the circulatory system in the various regions of the body.

According to Sayers and others, the symptoms depend largely on the percentage concentration in the blood in relation to the duration of exposure and the accompanying muscular activity. The concentration resulting from long exposure brings about more severe symptoms than the same concentration resulting from a short exposure. Table I of acute symptoms is compiled from various reports.[9,14]

For men at rest in the presence of .03 per cent carbon monoxide in the air breathed for two hours results in 25 per cent saturation of the blood; if breathed for four hours in about 32 per cent saturation of the blood.[10]

Haldane says 0.01 per cent is the highest concentration one should have for eight hours or more. Tests on eight men showed that simple tests of reaction times, binocular vision, coördination of hand and eye were unaffected until the blood was 30 per cent or more saturated. Subjectively the men felt normal with the above saturation.[10]

TABLE I.

Percentage saturation of blood	SYMPTOMS
0–10	No symptoms except some shortness of breath on vigorous muscular exertion.
10–20	No symptoms in some cases, tightness across forehead, possibly slight headache, dilatation of cutaneous blood vessels.
20–30	Headache (usually throbbing), irritability, easy fatigability, disturbed judgment.
30–40	Severe headache, weakness, dizziness, dimness of vision, nausea, vomiting, possibly collapse.
40–50	As above, confusion and collapse more likely.
50–60	Syncope, increased respiration and pulse, coma with intermittent convulsions, Cheyne-Stokes respiration.
60–70	As above, depressed heart action and respiration, death if exposure too long.
70–80	Weak pulse and slowed respiration, respiratory failure and death.
Over 80	Rapidly fatal.

A concentration of 0.06 per cent in air may produce headache within one hour and unconsciousness in two hours, while 0.1 per cent may produce unconsciousness in a little more than one hour and may prove fatal in four hours.[20]

A concentration of 0.02 per cent CO in air, breathed for 3½ hours causes 20 per cent saturation of CO in the blood, leading to tightness across the forehead and headache.[19]

During exposure there is a prolonged period of forceful breathing leading to alkalosis by reducing the carbon dioxide of the blood.[9]

The symptoms of ordinary poisoning in the order of occurrence are: weakness, headache, nervousness, fainting, respiratory failure, and, finally, circulatory failure.[9]

White of The Mayo Clinic in a rather comprehensive report lists "tightness across the forehead, headache, malaise, nausea, vomiting, palpitation, muscular weakness, convulsions, coma and death in the order given." He also mentions myocardial weakness, cardiac infarction, and ocular changes such as disturbances of vision and amblyopia.[19]

Many other symptoms are reported. Stearns, Drinker, and Shaughnessy report twenty-two patients who exhibited electrocardiographic changes, eighteen of whom showed paroxysmal auricular fibrillation, one transitory intraventricular block, two ventricular premature contractions, and one auricular premature contractions. They concluded that CO asphyxia may produce no important electrical changes and that changes in T-waves and in S-T segments occur most frequently.[17]

Beck and Suter say that CO affects principally the vascular system, resulting in dilatation of the peripheral vessels, slowing of the blood stream, and increased permeability of vessel walls with hemorrhages, perivascular infiltration, and edema. Fatal cases of epistaxis and hemoptysis have occurred; also cases of bleeding from the stomach, intestines, and kidneys. Due to vascular changes from impaired nutrition, arterial spasm followed by thrombosis and gangrene may result. The heart may even rupture. They base their study on 136 cases of chronic poisoning seen during a period of fifteen years. The chief complaints of many of these patients were referred to the cardiovascular system, the most outstanding symptoms being palpitation, dyspnea, irregularity of heart action and precordial distress. There were cases of encephalitis with the parkinsonian syndrome and cases of cerebral thrombosis. Electrocardial abnormalities were encountered that disappeared after recovery.[3]

It has been thought that CO as a causative agent of myocardial disease may help to explain the seasonal incidence of coronary thrombosis. Wood and Hedley reported ninety-four cases in autumn and winter and only fourteen in spring and summer in Philadelphia in 1935.

Beck reports a study of ninety-seven patients who were repeatedly subjected to sublethal doses of CO at varying intervals over prolonged periods. Of this group the following symptoms were recorded: headache fifty-eight, vertigo and headache forty-six, general weakness fifty-two, weakness and tremulousness in legs with ataxia thirty. Nervous and mental symptoms were present in almost all, the leading ones being feelings of depression, restlessness, anxiety, and fears, but also prominent were introspection, emotional upheavals, mental retardation with memory defects and at times confusion. Drowsiness and insomnia were frequent, paresthesia was present in thirty-six, speech defects in seven, and paraplegia in three. Vasomotor instability was common and was manifested in morbid flushing, local sweating, cold extremities, and purplish congestion of the hands and feet. Neuromuscular manifestations were common, the outstanding one being pain. Pain was found to be of the dull aching type and present mainly in the back, shoulders, epigastrium, lower abdomen and chest, or of the acutely spasmodic type causing cardiospasm in six, pylorospasm in one, uterospasm in three, anal spasm in three, ureteral spasm in two, dysuria in ten, muscle spasm (usually in the legs) in seventeen, painful spasmodic contraction in one or more of the toes in fourteen. There was fibrillation of bundles of muscles in twenty-six. The majority of the patients had digestive disturbances, nausea and vomiting being present in sixteen, and gastric analysis being deemed necessary in fifty-nine. Two patients had symptoms of gastric ulcer for which they were getting treatment, but three or four days after admission to the hospital realized spontaneous relief. Of the cardiorespiratory manifestations, dyspnea was noted in thirty-six, palpitation in twenty-seven, coughing in fifteen, yawning in five, precordial distress in fourteen (two had typical angina pectoris), bradycardia in thirty, and hypotension in forty-nine. Of the genito-urinary symptoms, nocturia and dysuria were quite common and several had incontinence. Glycosuria was present in thirteen and albuminuria in twelve. Some of the women complained of menstrual disturbances and some of the men of diminished libido. The red blood cell count was found to be over 5,000,000 in forty-four.[2]

Nichols and Keller describe a case of delirium which came on following three days of unconsciousness and one day of clearness after poisoning from a gas heater. Neurologically the patient showed cog-wheel resistance in all extremities, right-sided pyramidal tract signs, and excruciating tenderness of all the peripheral nerve trunks. Then aphasic disturbances developed; the patient could use a comb and brush but could not name them. She later learned the names as one picks up a foreign language, and learned to write script but could not print.[12] They also describe a patient in whom grand and petit mal developed a year after a suicidal attempt with gas. In the meantime he had to be kept in an institution and his intelligence quotient, which previously had been 105 on the Stanford Binet test, dropped to a five-year level.[8]

Killick describes a study in which it was found that successive exposures to the gas not only lessened symptoms but degree of saturation of the blood changed in relation to the concentration of the CO breathed. In other words, a state of acclimatization resulted. However, no increase was noted in the red blood cell or hemoglobin count.[11]

Beck and Suter found that the tolerance of laboratory animals was increased on repeated exposures, but here an increase in the red blood cell and hemoglobin counts were noted.[3]

Dancey and Reed describe a patient who one week after exposure developed the symptoms of hebephrenic schizophrenia. Eight months later she had recovered sufficiently to go home. They describe another who one month after exposure developed a condition resembling general paresis. After four months, this latter patient had fairly well recovered except for amnesia.[8]

Cohen describes a case of speech perseveration and astasia-abasia four weeks after a coma of seventy-two hours from CO intoxication. Recovery was fairly good after three and one-half months except for some disorientation and memory disturbance, and on fatigue occasional repetition of sentences and ideas.[7]

Carbon monoxide poisoning may cause encephalitis.[1]

Ormsby describes multiple gangrene of the hands and feet following poisoning with CO. The early lesions were bullæ of the type seen in a second degree burn.[13]

Much variation is seen in pulse and temperature, especially in acute poisoning. Usually the pulse is above 76 and the temperature low. Temperature has been seen between 94.6 and 102.8.[17] The blood pressure is not affected.[5]

Dancey and Reed describe a CO syndrome. There is a history of exposure, pulmonary edema, a latent period, then clinical evidence of lenticular nucleus involvement, and the common features of an organic psychosis with amnesia, confusion, and emotional instability.[8]

In the majority of fatal cases, the patient dies of acute asphyxiation, usually without regaining consciousness. In others, he becomes apparently well and three to seven days later develops secondary symptoms referable to the heart, lungs, or central nervous system, resulting in death.[3] The most frequent cause of death, if the patient survives exposure to the gas, is pneumonia.[9]

Postmortem Findings.—Those who die a few days or more after the poisoning often show bilateral necrosis of the globus pallidus.[4, 8] Selective action on the globus pallidus may be explained on anatomical grounds since this structure is supplied by long arteries that terminate in it. When death occurs from acute poisoning the most characteristic changes are bright-red blood, which is not coagulated, the pinkish- or reddish-colored viscera, reddish discoloration of the face, diffuse reddish patches on the superior surfaces of the neck, trunk, and extremities, and pink or red hypostatic areas on the dependent portions.[4]

Nichols and Keller give the pathological picture of the brain after seven weeks as follows: The pia is thickened and the vessels show connective tissue proliferation. In the cortex, there is evidence of vascular overgrowth and many shrunken, dark-staining, pyknic nerve cells with clear spaces about them. Neuronophagic cells occur, filled with fat and pigment. There is also some micro- and macroglial overgrowth. In the subcortical white matter, there is considerable destruction of myelin. There are degenerative changes in the basal ganglia, greatest in the anterior portion of the globus pallidus, which frequently shows anemic necrosis. Vacuoles are frequently found scattered throughout the brain substance.[12]

The classic anoxemic lesions in the heart are hemorrhagic necrosis and evidence of granulation and regeneration. Macroscopic hemorrhages in the apices of papillary muscles are occasionally found. Lesions are also found in the mitral valves and in the wall of the left ventricle. Coronary thrombosis has been observed as well as thrombi in small vessels.[3]

Degenerative and atrophic conditions are occasionally found in the ependymal cells of the choroid plexus, also damage to the anterior horn cells of the spinal cord may occur.[8]

Laboratory Detection of CO.—Absolute diagnosis of CO poisoning is dependent on the finding of carbon monoxide hemoglobin. Katayama's test is one of the best. It will detect as little as 10 per cent saturation of hemoglobin with CO. The test is run in this manner: 10 c.c. of water are placed in each of two test tubes. Five drops of suspected blood are added to one, and five drops of normal blood to the other. Then five drops of fresh orange-colored ammonium sulphide are added to each, mixed gently, and made faintly acid with acetic acid. If carbon monoxide hemoglobin is present a rose red color will develop. The control becomes a dirty greenish brown.[18]

Hoppe-Seyler's test is less sensitive and less satisfactory but a little simpler. Place three c.c. of water in a test tube, add three to five drops of blood and one drop of 5 per cent NaOH, mix gently, and let stand one hour. Blood containing carbon monoxide hemoglobin is more or less pink, while normal blood gives a greenish-brown color.[18]

Carbon monoxide hemoglobin has a characteristic spectrum, and when present in sufficient amount (30 per cent or more) is readily identified with the ordinary "pocket" spectroscope.[18]

Carbon monoxide indicators are now available on the market which indicate by direct reading the percentage of carbon monoxide present in blood or air.[20]

Use of the spectrophotometer gives an accurate quantitative measurement of CO in blood.[6]

Absolute diagnosis is made by the pyrotannic acid method or Van Slyke method.[19]

Treatment of CO Poisoning.—First remove the patient from the carbon monoxide atmosphere. In mild cases, this, plus bed rest and observation for twelve to twenty-four hours, is all that is necessary. In the comatose patient who is not breathing, or whose breathing is weak and ineffectual, start artificial respiration at once, and keep it up until the patient is breathing normally or until rigor mortis sets in. It is advisable to use the inhalator with oxygen, or, better still, with 93 per cent oxygen and 7 per cent carbon dioxide. In very severe cases 10 to 30 per cent carbon dioxide is recommended.[9]

By inhalation of oxygen, the dissociation of CO is accomplished about twice as rapidly as with ordinary air.[4] "The stability of carbon monoxide hemoglobin is due, not to the speed of its formation, but to the slowness of its dissociation."[16]

Remember the comatose patient is in shock, so during the artificial respiration it is well to rub the patient's limbs vigorously, and apply hot water bottles and blankets to the body. If necessary give a cardiac stimulant such as caffeine or sodium benzoate.[19, 9]

Most writers say that methylene blue is of little or no value, but according to Brooks of the University of California, on her experiment with rabbits, it changes carbon monoxide hemoglobin to oxyhemoglobin in the blood very rapidly. Thus it appears as if its use should be rational and recommended.[6]

Blood transfusions are of no value unless given instantly.[19]

After revival, the patient should be taken to a hospital in an ambulance (exercise is dangerous!), and an oxygen and carbon dioxide mixture given for five to ten minutes every hour for six to twelve hours. The patient should remain in bed for several days.[9]

Solution.—Beck says that the solution for the problem of CO poisoning

> "lies in the administration of proper preventive measures through well trained industrial and sanitary engineers under the direction of municipal and state boards of health. More emphasis should be placed on public health instruction with regard to the hazard, and statistics should be more available, like those obtained from traffic accidents, in order to ascertain its real significance from a public health standpoint."[2]

It would seem that the following solution would be more comprehensive and more likely to bring about results.

1. Probably most important is that more responsibility should be placed on practicing physicians in:

(a) knowing the prevalence of carbon monoxide poisoning and suspecting the condition;

(b) knowing the symptoms, not only of acute poisoning but of chronic and relapsing poisoning also;

(c) knowing how to make an absolute diagnosis of the condition, that is, by the presence of carbon monoxide in the blood, and being adept in performing such tests;

(d) knowing first aid measures and general treatment, and avoiding mistakes. The most common mistakes made by physicians in acute poisoning are:

> 1. Pronouncing the patient dead because no sign of life can be detected. Eight to twelve hours of artificial respiration are needed to revive some patients.
>
> 2. Putting a non-breathing patient in an ambulance. Such a patient should not be moved until normal respiration is established.
>
> 3. The use of hypo medication. Intravenous and hypo medication are probably of no use.

4. Interfering with artificial respiration to examine a patient. It is useless and dangerous.[9]

(e) doing his part to make his patients conscious of the hazards of carbon monoxide poisoning.

The above suggestions can probably best be realized by placing more emphasis on all phases of the hazard in the medical school curriculum.

2. There should be education of the public, especially those likely to come in contact with the condition, such as firemen, policemen, and others, with regard to incidence, symptoms, and first aid. Statistics should be compiled and made available to the public.

3. Methods of accurately detecting injurious amounts of the gas in air should be developed and the public educated in detecting the gas in homes, garages, motor cars, et cetera. A possible solution of this point could be that the gas companies when installing gas in a home or apartment be required to supply each patron with a piece of apparatus for detecting leaking gas.

4. There should be more experimentation to determine better methods of treatment.

5. Finally, legislation should be enacted for the elimination of the hazard in factories, public garages, mines, and wherever there are employes. Such legislation should be supplemented by regular inspection under public health jurisdiction.

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THE MEDICAL LIBRARY—A LABORATORY FOR THE LITERARY PHYSICIAN

THOMAS E. KEYS, M.A.†

Rochester, Minnesota

BECAUSE of the tremendous increase in the literature of medicine brought about by rapid developments in the medical and the allied sciences, the medical library is without a doubt an important factor in modern medical practice. First, it is a storehouse for the medical literature of the past. A modern medical library, therefore, provides its patrons with an access to the progress of medicine throughout the years. This, in itself, is a significant service, for it makes it possible for every physician to know what has been done before. This is of moment not only to the physician contemplating a new investigation, but also to the clinician, because it provides him with the wealth of past experience in his combat with disease.

Second (and this is the most practical reason for the existence of the medical library), is the fact that it immediately affords the reader the latest developments in medical and surgical practice. The latest advances are published first of all in the current medical journals, which are the important holdings of medical libraries. Sometimes, as might well be imagined, the expediency with which a library can provide its patrons with papers on modern and tried methods of therapy may be an important factor in the saving of human life.

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†The author is Reference Librarian at The Mayo Clinic, Rochester, Minnesota.

But the use of a library is complicated. Drs. Billings, Cushing, Davis, Finlayson, Holmes, Osler, Winfield, Wylde and others have suggested that proper understanding of the use of the library is something that should be taught. Some medical schools include in their curricula studies in medical bibliography and the use of the library. Most medical men have had neither the opportunity nor the time for such study. It was thought, therefore, that it might prove useful briefly to describe some of the fundamental concepts concerning the use of medical libraries in general.

To be used most advantageously, the library might be thought of as a physician's laboratory. It is a workshop for the literary physician, and it is just as important to him as a well equipped laboratory is to the experimental bacteriologist, the hematologic laboratory is to the hematologist, or the laboratory of surgical pathology is to the hospital pathologist. And, as in the case of a laboratory, the patron should expect to find a usable physical plant as well as to receive a minimal amount of service from the library staff. That is, the library should provide its patrons with a fair number of books and periodicals, well-lighted study rooms with comfortable chairs and desks, access to the book stacks, and the necessary indexes and bibliographic tools to help them in their work. Also, the library staff should help and offer aid to the physician engaged in literary research.

To use a library intelligently, readers should have a clear understanding as to (1) what constitutes a library and (2) what they can expect in respect to service or help in answer to their many problems. Most libraries of moderate size consist of an adequate number of medical journals and a fair collection of monographs, textbooks, medical reference books and other bibliographic aids. The size and resources of libraries are dependent, to a large extent, upon the size of the communities they serve and the money that is available to them. A large medical center such as Chicago, for example, should provide its patrons with an immense variety of materials, and conversely, a small medical library, whose resources are dependent upon the local county medical society, should not be expected to have more than a minimal number of books and journals.

A library may be said to exist for the preservation and distribution of ideas by way of the written and printed word. The preservative function of libraries includes the purchase and storage of books, periodicals, and ephemeral materials. The function of distribution embodies the methods which are available to interpret the library's resources to the reader.

Since most persons are primarily interested in the practical use of the library, what then are the librarian's methods of making these resources available? First, the library provides its patrons with the public catalogue. A catalogue in its fundamental meaning is nothing more than a list of the holdings of the library. For the sake of convenience it is generally an alphabetical file of cards, but it may be bound in book form. It may be arranged alphabetically according to subjects; it may be arranged alphabetically according to the names of authors; or it may have a lexicographic arrangement, the cards being filed with author and subject entries in one alphabet. The lexicographic arrangement is preferred and is used by most libraries because it is more convenient. To supplement the catalogue of books owned, a library may have a catalogue of its periodical holdings.

To obtain a better knowledge of the books in the library, the reader should have access to the book stacks. In research or working libraries, where it is practicable, this arrangement is especially important. No matter how carefully books are catalogued, there is no substitute for the books themselves. If books are placed on the shelves in logical sequence, the reader will obtain a fair idea of the library's holdings. This knowledge may permit him to become familiar with the contents of many books which might otherwise be overlooked. Since each library has its peculiarities, it is imperative that the reader be acquainted with the way in which volumes are arranged on the shelves.

Personal instruction by the librarian should be given to each patron on the practical arrangement or scheme by which the library books are shelved. This scheme is generally called the "classification." Theoretically, classification is the outline of knowledge, but applied to books in libraries it is considered to be an outline to follow for the shelving of books. Most classification schemes, however, have important theoretical bases. That is, a classification scheme covering the field of medicine should attempt to outline that field. There should be an introduction to the subject. This may be supplied by reference books, directories, dictionaries, encyclopedias, bibliographies, histories, and books on bibliography. Following these, logically, come the books on the basic sciences, such as biology, anatomy, physiology, biochemistry and bacteriology. The general subject, medicine, might form the body of the classification scheme. In this section might be filed the textbooks and more extended treatises on medical practice.

Next, perhaps, as suggested by the classification plan of the Boston Medical Library, are grouped the books on the different medical specialties. These should be shelved in separate sections and would include, for example, books on pathology, syphilology, cancer, diseases of the thorax, diseases of the gastro-intestinal tract, urology, orthopedics, otolaryngology, ophthalmology, surgery, obstetrics, gynecology. The remaining sections of the classification plan might be devoted to medicine and its relationship to other endeavors. In this section might be grouped books on medicine and law, medicine and industry, medicine and the state, hygiene, and medical economics..

The next provision the library makes is to place the reference books within easy access of the reader. The reference books are the numerous bibliographic aids which might contain answers to readers' problems. Included are such useful books as the medical indexes and other bibliographies of medicine; the directories; the dictionaries and encyclopedias; the almanacs and atlases; the loose-leaf sets; and the books on medical history and biography.

Most medical libraries, it is hoped, "open their houses" to readers. To what extent they will offer further services will depend somewhat upon library policy and the size of the library budget. In some medical libraries, where there is a liberal attitude, many services are offered the readers. In other libraries, however, the reader should expect to pay a reasonable fee for such services. One of the most important services offered by most libraries is accomplished by the interlibrary loan system. Although a modern medical library may be rather complete in its holdings, there are certain books or journals which may be needed occasionally, which may not be in the library. If the reader needs such books, the librarian may borrow them from some well-stocked library. To be sure, no library will lend its treasures, such as the *Fabrica* of Vesalius or even the first edition of Beaumont's *Physiology*, and very few libraries will lend books which were printed in the Eighteenth Century or earlier. If these volumes are desired, perhaps the best solution would be a trip to the library that houses them. But photostatic copies of most valuable books may be made for the reader. To copy a book photostatically is rather costly. Photo filming of books and journals on 35 mm. continuous film stock is less expensive, providing the library has a reading machine or projector with which the patron can view the finished product. The American Medical Association* will lend the journals in its library to members and to individual subscribers of its journal in the United States and Canada. The American College of Surgeons maintains a package library service for fellows of the College without charge. This service consists of supplying, on request, reprints and clippings from journals on particular subjects. The material, although it is not complete on any one subject, must be very valuable to a fellow who lacks library facilities.

Another service offered by many libraries is the preparation of medical bibliographies. Some users of a library prefer, and wisely, I believe, to look up their own material. These readers will need help, at first, from the librarian on the use of the medical indexes. Other readers feel that the librarian is better equipped to do this bibliographic work. Some libraries are able to provide this service free. Others cannot afford to do this and employ scholars who will do this work at a moderate cost to the patron.

In addition to the preparation of bibliographies, the special services of some libraries include abstracting and reviewing the literature, translating articles, and collecting case reports. If the physician finds that these services are not available at his library, he may communicate with private agencies who will do this work for him. The American College of Surgeons provides these services for its members for a modest fee. Certain private medical publishers maintain bibliographic and research departments which can be used by physicians. Names and addresses of such publishers may be obtained from the American Medical Association.

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*The American Medical Association lends periodicals for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1928 to date. Requests should be accompanied by stamps to cover postage.

To aid readers in their understanding of medical bibliography, formal lectures are sometimes offered library users. Such lectures consist of comments on the chief bibliographic tools, the importance of complete bibliographic description of references to the literature, and a few rules on bibliographic citation.

Another important service a library can offer is the recording of references to the literature as they appear. Because of the large number of periodicals indexed and the mechanical problems of indexing, it is impossible for bibliographers and publishers to keep the indexes up-to-date. A few libraries keep an index of the articles of the leading medical journals as they are published. Some librarians record new articles on particular phases of medicine at the request of the library user.

The librarian can render other services, such as the location of addresses of physicians in Europe, biographic sketches, bibliographic information about new and old medical books, in addition to the ordinary matters of library economy. Mention should be made of questions of nonmedical character. If the library is equipped for such services, the library user may be able to find answers to some of his questions. However, such questions can be answered better by the public library.

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TRAUMATIC INGUINAL HERNIA

STANLEY R. MAXEINER, M.D., F.A.C.S.

and

HENRY E. HOFFERT, M.D.

Minneapolis, Minnesota

PROTRUSION of some portion of the abdominal contents through a weak spot or cleft in the abdominal wall is, and always has been, one of the most common surgical ailments. The terms rupture and breach are survivals of the old idea that the protrusion was actually due to a tear through the peritoneum. It has only recently been realized that although increased intra-abdominal tension, due to lifting, straining or active exercise generally, is often the immediate exciting cause of the protrusion, a hernia would rarely occur were there not present a preformed sac or at least an abnormal relaxation, in an existing cleft or opening. This is particularly true of the inguinal canal, as embryology has shown. And since herniations in this region have incapacitated active men from time immemorial, they have always excited the greatest surgical interest.

McGavin states that the opinion is becoming more general that many cases hitherto regarded as acquired, are in reality congenital.

Sir Arthur Keith contests the theory of preformed or congenital sacs in the origin of herniæ. He holds that herniæ which occur in adult men and women are all of them, or almost all of them, of gradual production. Repetitions day by day of straining at stool, stooping, lifting, coughing and other bodily movements cause the abdominal contents to beat against their containing walls and gradually to evaginate the weakest points of the abdominal wall, thus in the course of time giving rise to hernial protrusions. Then, he states, a sudden effort which in a normal man would be harmless, turns a partial or incipient hernia into a real one.

Ochsner notes that there can be no doubt about the existence of an hereditary tendency to hernia in many families. He affirms, however, that the chief exciting cause is increased or abnormal intra-abdominal pressure which may be very violent and of only short duration as in lifting heavy weights, falling a great distance or with great force, violent coughing or sneezing. In such cases the tissues are virtually torn, making an opening through which the hernial contents protrude.

De Quervain states, "Most so-called traumatic herniæ are of the indirect inguinal variety, but all forms of hernia have at times been ascribed to injury. We may, however, discard the possibility in direct inguinal and umbilical hernia and should be very skeptical with reference to femoral hernia."

The hernia problem is one of perennial interest and difficulty to industrial boards. A vast number of claims are based on this abdominal lesion, many of them no doubt without any sound compensable basis, and some certainly fraudulent. A considerable body of surgical opinion holds that traumatic hernia is of rare occurrence and must be associated with laceration or actual wounding of the abdominal wall and that all herniæ outside of this small class must be considered as congenital in origin.

The attitude taken on the part of the industrial courts, however, is that trauma, while perhaps not always responsible for the occurrence of the hernia, at least acts in the capacity of a contributory force or as it is commonly phrased, an aggravation of a pre-existing condition.

Inguinal herniæ occur in the weakest portion of the anterior abdominal wall and are the penalty which the human male pays for assuming the upright position. The inguinal canal normally is a more or less obliterated passage through which the testicles migrated from their original position within the abdomen to their postnatal position in the scrotum. In the progress of its descent, the testicle was preceded by a layer of peritoneum which was pushed down before it. Ideally, this tract is completely obliterated but it is repeatedly found at operation or at autopsy in individuals who have no recognizable hernia that remnants of the peritoneum which accompany the descent of the testicle still remain in the inguinal canal constituting what is commonly called a preformed sac. This sac can in many instances be demonstrated by X-ray in the presence of a pneumoperitoneum.

Some writers go so far as to conclude that traumatic hernia does not exist. They base their opinion upon the observation that few, if any, herniæ follow direct violence to the abdominal wall such as crushing injuries, blows of one type or another with blunt objects, etc. Others base their conclusions of the impossibility of traumatic hernia on the statistics compiled on a large series of laborers passing through routine examination with follow-up thereafter in which they found that those men who subsequently developed herniæ had relaxed external rings or cough impulse, or both, on their initial examination.

On what basis are we then to determine whether or not a given hernia may be considered to be traumatic in origin? Moorhead, Kaufman and others have laid considerable stress upon the fulfillment of certain criteria before any hernia may be considered traumatic: (1) Adequate violence. This presupposes intra-abdominal pressure of an extreme degree; not the repetitions of ordinary living but the result of some very unusual act. (2) Adequate effects. These should be immediate. Pain is the usual symptom and is often of the testicular variety sufficient to cause immediate syncope, nausea and sometimes vomiting. Swelling results promptly and often this is accompanied by edema and ecchymosis. Tenderness on pressure should be present. (3) Operative findings. Some extraordinary finding such as ecchymosis, tearing of the peritoneum, edema or other evidence of recent injury must be present.

Those herniæ following strain, heavy lifting, violent coughing, etc., can hardly be classed as being due to trauma. However, if there are present the criteria of adequate violence with adequate effects as listed above, together with surgical findings consistent with the history of the accident, we feel a diagnosis of traumatic hernia is perfectly justified.

Case Report

J. N. H., a man twenty-five years of age, was injured shortly before admission to the hospital in a fall from the top of a grain elevator, a distance of about sixty feet, in which he landed in an upright position. He was rendered unconscious and was found a short time later by fellow workers. He was suffering excruciating pain and was transported to the nearest doctor's office where examination revealed the presence of an irreducible mass in the right inguinal region, a comminuted compound fracture of the right os calcis and a compression fracture of the first lumbar vertebra.

The patient stated that to his knowledge he had never had a hernia preceding the accident. The ring on the opposite side was not relaxed and there was no cough impulse.

He was transported to the Hospital as soon as he had sufficiently recovered from shock where an emergency herniorrhaphy was performed. At operation it was found that the mass which protruded from the internal ring consisted of a large quantity of edematous omentum with the peritoneal covering thereto torn in several places allowing the abdominal contents to lie outside of the peritoneal cavity. Attempts at reduction were unsuccessful until the internal ring had been enlarged. There was no evidence of ecchymosis.

Conclusions

1. Traumatic inguinal herniæ are of exceedingly rare occurrence.

2. The ordinary industrial hernia should not be considered traumatic.

3. Only those herniæ in which there has been adequate violence together with adequate effects and operative findings consistent with the history of the accident should be placed under this classification.

4. We feel that the case which we are herewith reporting falls in this group.

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PSEUDO-DIAPHRAGMATIC SHADOW DUE TO PLEURAL FLUID*

OSCAR LIPSCHULTZ, M.D.
Minneapolis, Minnesota

IN A PLEURAL cavity free of adhesions, fluid will first accumulate in its postero-inferior and lateral portion when the patient assumes an upright position. As the amount of fluid increases, it ascends in the pleural cavity so as to be seen best in the lateral periphery of the chest, as a ribbon-like shadow in the axillary line. The fluid also extends medially so as to obliterate various portions of the diaphragm, depending on the extent of the effusion. It has been assumed that the hydrostatic pressure of the fluid, the retractile force of the lung, the capillarity of the pleura and the negative intrapleural pressure account for this usual distribution of fluid. Occasionally, however, free fluid, instead of distributing itself in this manner, will gravitate to the inferior-most portion of the pleural cavity and insert itself between the inferior surface of the lung and the diaphragm. Thus, the superior surface of the fluid in contrast with the aerated lung gives the impression of an elevated diaphragm.

Rigler[2] has shown that transudates and most pleural exudates move considerably with change in position, and that pleural exudates both purulent type and non-purulent which have been present sufficiently long to produce adhesions may not change in their distribution even with extreme changes in position. His work was prompted in answer to the wide differences of opinion which were to be found in the literature as to whether or not pleural effusions shift in position with change in position of the patient, as well as in answer to the questions of the degree of shift and the rapidity of the reaction. In carrying out his problem, Rigler used, in addition to the usual erect, supine and lateral views of the chest, a position which he termed the lateral decubitus position. This view is accomplished by having the patient lie on the involved side with the film in front and the x-ray tube behind. The patient is built up so that the cassette may be permitted to come sufficiently low to permit the axillary portion of the thoracic cage to be included on the film. This view is especially effective in the visualization of small quantities of fluid. It can also be used to indicate the mobility and the rapidity of movement of fluids, as well as to determine whether certain shadows are due to pleural effusions which have distributed themselves in an unorthodox manner.

Atypical distribution of pleural fluid has been called to our attention before and is not looked upon as anything new. Westermark[4] in 1935 added thirteen cases to a group of five cases reported by Jacobeus and himself in which free pleural fluid had arranged itself, as we described above, in what he termed a paradoxical manner. He called attention to the fact that others noticed that fluid had behaved in this same manner but had not been able to explain this phenomenon. Free fluid usually arranges itself in the pleural cavity so that its upper border extends obliquely medialward and downwards. The usual situation of the free pleural exudate is determined by the maintenance of those normal factors governing the distribution of fluid. In all of Westermark's cases there was an obstructive atelectasis due most often to cancer of the lung; others were due to tuberculosis, pneumonia, bronchiectasis, and trauma. In atelectasis there is an increase in the negative pressure in the pleural cavity. Westermark thought that the alteration in pressure relations in obstructive atelectasis influenced the situation of the pleural exudate, and accounted for the paradoxical situation of the fluid. The location of the atelectasis also governed the distribution. Korol and Scott[1] attempted to account for this atypical distribution on the basis of concealed air-pockets which they were able to bring to light only in the lateral decubitus position with the involved fluid-containing side uppermost on the plate.

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*From the Departments of Radiology of the University of Minnesota and the Minneapolis General Hospital, Minneapolis, Minnesota.

The explanations of Korol and Scott and that of Westermark are basically the same, in that they both depend on altered elasticity of the lungs for the resulting changes in the distribution of fluid. Korol and Scott speak of hidden air-pockets, which are actually cases of hydropneumothorax. In pneumothorax, the usually negative intrapleural pressure becomes positive. When this happens the lung loses its elasticity and collapses, the capillarity of the pleura being lost. The fluid which is present is influenced only by gravity and accumulates in the inferiormost portion of the pleural cavity, very much as fluid in a barrel. In Westermark's cases, the obstruction to the bronchus, whether intrinsic or extrinsic, caused an atelectasis with a resulting increase in the negative intrapleural pressure. It would appear then that the atelectasis, which is the common factor in both situations, permits the fluid to gather as it does.

The phenomenon of pseudo-diaphragmatic shadows was first noted by the author in a case of bilateral serous exudate of unexplained origin. The fluid on the right side had arranged itself in pseudo-diaphragmatic fashion whereas the fluid on the left side, which was much less in amount, behaved in the usual manner. This has also been noted in cases of carcinomatosis, heart failure and in one instance of lymphoblastoma with marked mediastinal glandular enlargement. In none of these cases was there any evidence of atelectasis or pneumothorax except in the case of lymphoblastoma where the enlarged mediastinal nodes may have caused a partial atelectasis of the right lung. In our experience this atypical distribution of pleural fluid has been seen most often in heart disease where repeated decompensations producing fibrosis may be the factor in altered elasticity of the lung. The explanation of altered elasticity in the other types of cases is not apparent to us unless the disease process which causes the fluid also affects the elasticity of the lung.

Roentgenograms of the chest where fluid is atypically distributed give the impression of an elevated diaphragm. On fluoroscopy, with the patient in the upright position, the diaphragm will also appear to be elevated. On inspiration, movement of the pseudo-diaphragm is often quite normal or very slightly restricted, but not lost. The lung on this side of the chest will usually be as radiable as the opposite normal side. There is no succussion splash as in hydro-pneumothorax when the patient is shaken. No other findings are to be noted when these patients are fluoroscoped in the upright view. In all our cases, the fluid had formed in the right pleural cavity. Yater and Rodis[5] reported a case in which the fluid had gathered in a similar manner in the left pleural cavity. On screening in the upright position, they observed a fluid wave due to the transmitted heart impulse. On fluoroscopy with the patient in the supine position, there was always a diminution in translucency of the hemithorax on the fluid-containing side due to the fact that the fluid spread itself over the surface of the lung from base to apex. The supposedly high diaphragm was no longer to be seen but the true diaphragmatic shadow could sometimes be visualized. The fluid assumed its original distribution when the patient was returned to the upright position. Films made in the supine and lateral decubitus positions demonstrated that the fluid behaved as all free fluids were shown to behave by Rigler.[3] In the supine position, the fluid spread from apex to base, whereas in the lateral decubitus position the fluid arranged itself along the lateral periphery of the chest between the pleura and the lung. The case of lymphoblastoma with effusion is interesting enough to be reported in detail.

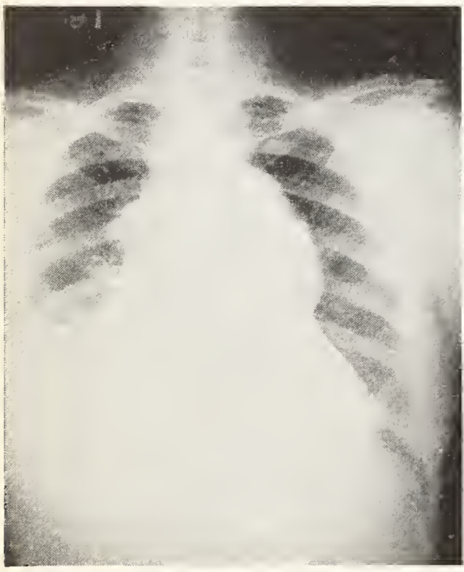
Fig. 1.

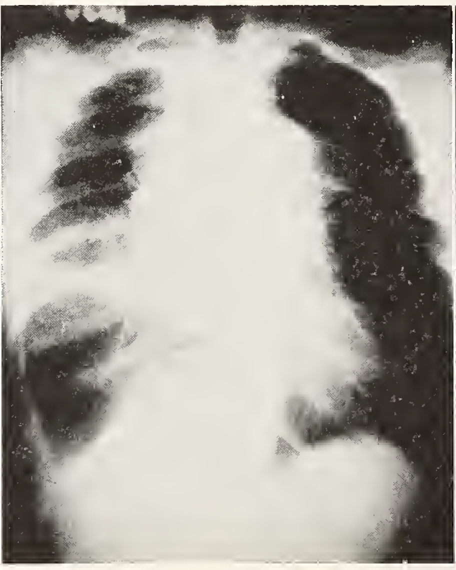
Fig. 2.

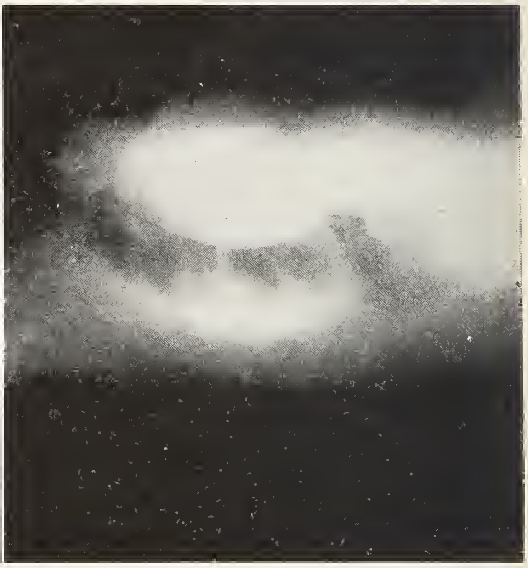
Fig. 3.

Fig. 1. Roentgenogram of chest, postero-anterior view, upright position. The mediastinal shadow is markedly widened from the enlargement of the lymph nodes. Note the shadow at the base of the right lung simulating exactly a high right diaphragm.

Fig. 2. Roentgenogram of chest, supine position. The shadow at the base of the right lung has changed radically from its appearance in the upright position (Fig. 1). It is obvious that fluid was present over the right diaphragm which in the supine position has spread diffusely over the lung. Note particularly the extension of fluid into the mediastinal pleural space and into the interlobar fissures, producing a bizarre appearance with a triangular shadow at the base

Fig. 3. Roentgenogram, postero-anterior view, in the right lateral decubitus position reveals that the fluid has accumulated along the lateral chest wall and has displaced the lung so as to produce a dense shadow between them.

Case Report

The case is that of a white woman, aged 54, who first complained of pain in the chest to the right side of the sternum nine months previous to admission. The pain was of a dull, aching character and of an intermittent type. There was a period of about three months of complete freedom from pain. One month prevous to admission, the patient developed a hacking cough which was present mostly at night. The patient raises little or no sputum and has never raised any blood. She has been growing weaker, and has experienced dyspnea on slight exertion.

Physical examination revealed a well-nourished, well-developed white female, whose only positive findings were in the chest. There was an increase in the dullness of the superior mediastinum with evidence of fluid in the right pleural cavity. The urine, blood and blood Wassermann tests were negative.

Roentgenogram of the chest revealed a widened mediastinal shadow together with what appeared to be an elevated right diaphragm (Fig. 1). The patient's chest was then fluoroscoped because of an established routine in chest cases revealing elevated diaphragmatic shadows on film study. During this procedure in the upright view the supposed right diaphragm moved slightly. Both lung fields were equally well aerated. Fluoroscopy in the supine view revealed decreased radiability of the right lung and a vaguely visualized right diaphragmatic shadow on practically the same level as the left side and not elevated as originally suspected. When the patient was returned to the upright position, the findings were again the same as seen initially. These fluoroscopic procedures were repeated many times but with no change in the findings. It was apparent that we were dealing with fluid which accumulated between the under surface of the lung and the diaphragm.

Roentgenographic study with the patient in a supine position (Fig. 2) revealed that the fluid had spread from base to apex, producing a change in the translucency of the right chest as compared to the left. Some fluid has also been sucked into the horizontal fissure and some has spread itself along the mediastinal portion of the pleural cavity to produce a trangular shadow on the right side inferiorly. Study in the right lateral decubitus position (Fig 3) revealed that the fluid had accumulated between the lateral wall of the thorax and the lateral surface of the lung.

On thoracentesis 1,000 c.c. of blood-tinged fluid was removed. Some of this fluid was centrifuged and blocked. The pathologist reported, "There are scarcely any cells, but those present seem to be markedly lymphocytes. There is nothing suggesting tumor tissue." Conclusion: "Mild chronic inflammatory exudate."

It is suggested that all patients in whom studies of the chest reveal what appears to be an elevated diaphragm be further examined in order to determine the possibility of a pleural effusion in which the fluid has arranged itself between the inferior surface of the lung and the dome of the diaphragm. This is especially important in cases in which the elasticity of the lung has been altered so as to produce atelectasis more readily, as in cardiac conditions, in instances of atelectasis by intrinsic or extrinsic pressure on a bronchus as in carcinoma or mediastinal tumors, or in cases of pneumothorax where the air has become concealed.

Conclusions

1. Fluid in the pleural cavity usually accumulates in its most dependent portion with an upper level which extends obliquely medialwards and downwards.
2. The usual distribution of fluid is due to hydrostatic pressure, capillarity of the pleura, elasticity of the lung and the negative intrapleural pressure.
3. A change in the elasticity of the lung will cause fluid to arrange itself atypically so as to simulate a high diaphragm.
4. Fluoroscopic or film study with the patient in a supine position as an adjunct to the usual upright film will bring this condition to light.

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## ◆ CASE REPORT ◆

SUPPURATIVE PANCREATITIS*

F. C. SCHULDT, M.D.

Saint Paul, Minnesota

It is not my intention to review the subject of pancreatitis, because it is so well covered in recent literature, but, rather to confine myself to a report of a case of acute suppurative pancreatitis. I wish to report this case for two reasons, first, because the mortality without operation is so high, and, second, because this case exhibits some factors not encountered in other cases.

O. S., male, aged fifty-one, was first seen April 7, 1935. He complained of a pain in the upper right quadrant which had come on the day previous.

Cholecystectomy had been performed in 1930 for empyema of the gallbladder and innumerable small stones were present.

The next day he was slightly jaundiced, and the urine was dark. Three days later he felt better, there was less jaundice and the urine was lighter. Three days after that he suddenly developed a severe upper abdominal pain with nausea and vomiting. Then he was tender in the epigastrium. The next day the urine showed the presence of 3 plus bile, the scleræ were yellow, but he had less pain.

The jaundice disappeared, the urine cleared up and the stool was a brown color. A week later on April 25, he had again a severe colic at 6 a.m., and became jaundiced. The pain attacks and jaundice became increasingly worse.

On April 28 the patient was removed to Midway Hospital. Temperature and pulse were normal. I felt that he had a stone in the common duct which acted as a ball valve and operated on him April 30, 1935, under ether ethylene anesthesia. Incision was made through the old incision which had a postoperative hernia. The liver appeared swollen. The head of the pancreas was hard and this hardness extended onto the body. The head of the pancreas also was exceedingly large so that it lay over the area where one would search for the common duct. Adding to our difficulties, the first portion of the duodenum was firmly fixed high under the liver. By means of careful and tedious dissection we finally managed to free the duodenum, which had an acute angulation but no ulcer of perforation. All the tissues were very edematous and the overlying duodenum was quite unrecognizable. There now appeared only a small area where the common duct might be. The large hard pancreas head and the edema of all the structures were difficult barriers. By means of fine needles, I tested out the area and twice I drew arterial blood and once venous blood, but never bile. The only correction I had succeeded in making was to free this fixed duodenal loop. The head of the pancreas was as hard as cartilage, but did not fluctuate. A biopsy was now made of the pancreas. Drainage was established. The abdomen was closed with special attention to the post-operative hernia.

My operative diagnosis was carcinoma of the pancreas because of the hardness and size of the gland. Whether there was a stone in the common duct I did not know. Upon releasing the high hung duodenum there seemed to be a mechanical freedom as if a tension had been released on something. I had hoped to probe the common duct and establish a T tube drainage, but it could not be isolated. I was now hoping that the release of the duodenal tension would give us the necessary mechanical help and free the bile. However, if the biopsy proved to be malignant, the outlook would be unfavorable. The post-operative course was better than expectations. In five days the jaundice had nearly all cleared up, the abdomen was soft and the stool was brown. The temperature was normal and the patient felt well.

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*Presented before the Saint Paul Surgical Society, November 10, 1938.

On the eighth day, the temperature rose to 101, and the patient again became jaundiced. On the thirteenth day there was no jaundice, the stool was brown, the abdomen soft.

The biopsy report by Dr. E. T. Bell was suppurative pancreatitis, and he dismissed me with these words, "If that patient lives a year the case should be reported." It is now four years.

On the thirtieth day he went home. His appetite and sleep improved. He rapidly regained his health and strength and has worked as a department manager ever since. There have been no attacks of pain or jaundice since.

In the following brief discussion I will refer frequently to references made by Golder McWhorter in his exhaustive article.*

McWhorter divides pancreatitis into three main divisions:

A. Acute idiopathic pancreatitis:
   1. Simple edematous or nonhemorrhagic pancreatitis.
   2. Hemorrhagic pancreatitis.
   3. Necrotic or gangrenous pancreatitis.
   4. Suppurative pancreatitis.

B. Acute pancreatitis with malignancy.

C. Acute pancreatitis following trauma.

Trypsinogen as secreted by the pancreas has no digestive power and is tolerated by the pancreas.

Senn and Flexner report that if the pancreatic ducts are cut and the inactivated juices allowed to escape into the peritoneal cavity there will be no necrosis and no clinical symptoms.

Trypsinnogen becomes activated in the presence of bile in the duodenum into trypsin.

Trypsinogen also becomes activated in the presence of infection. If infection is present within the pancreas an activation of trypsinogen into trypsin takes place which would be followed by hemorrhage or necrosis. In the same way, if a small amount of bile escapes into the pancreas due to some obstruction of the ampulla of Vater, a necrosis of the blood vessels and acini would follow.

Schönbauer reports that pancreatic juice may back up into the biliary tract and gallbladder and here the trypsinogen become activated into trypsin and thus causes a necrosis and gangrene of the gallbladder. Trypsin has been found in the gangrenous gallbladder. I recently operated on a patient with acute cholecystitis and cholelithiasis, who had gangrene of the cystic duct. Small amounts of bile introduced into the pancreas would, through the activation of trypsinogen into trypsin, cause a necrosis, hemorrhage and death.

Acute pancreatitis has its onset very commonly about an hour after a full meal.

Archibald has shown that bile can enter the pancreatic ducts in two ways:

A. By obstruction of the common duct when pancreatic and bile ducts are joined.

B. By regurgitation of the duodenal contents.

When no gallstones are present, obstruction may be due to a spasm of sphincter of Oddi, a congestion, swelling, or even intestinal parasites.

Wildegans made the observation that where the blood sugar level is over 300, the outcome is fatal.

Experimentally it has been shown by Villaret and Besancon that magnesium sulphate in the jejunum produces a bile without pancreatic juice while dilute hydrochloric acid produced the opposite effect.

In suppurative pancreatitis, complicated by jaundice, the surgical mortality is well over 55%.

The controversial question for or against immediate operation is staunchly supported by master surgeons on both sides.

Körte reports 103 cases of acute pancreatitis operated early with a 60 per cent mortality. He advocates early operation. Of seventy-seven patients with various types of pancreatitis not operated on, all died.

It is generally considered by all authorities that following a cholecystectomy, pancreatitis is less frequent. In our cases the gallbladder had been removed five years previous. Stones could not be found in the common duct. The interesting mechanics of a duodenum hooked up tense to the under surface of the liver causing a mechanical difficulty and jaundice, then suddenly released with immediate relief of jaundice and pain, was dramatic.

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*McWhorter, Golder L.: Acute pancreatitis. Arch. Surg., 25: 958-990, 1932.

TUBERCULOSIS DEATHS AMONG YOUNG WOMEN

The excess of deaths from tuberculosis among young women over that of males of the same age has long been regarded as an enigma by the medical profession. In an exhaustive study made in New York and Detroit, every death during one year from tuberculosis among young women was carefully investigated and several facts emerged from an analysis of the material obtained.

School life, race, nativity, participation in industrial life, insufficient clothing, poor food habits including the ever-present dieting fads, lack of sleep and too much recreation seem negligible in their influence. The real hazard is the psychic and physical changes attendant upon adolescence and maturity. Early marriage and child-bearing increase the death rate from tuberculosis in this group.—Nicholson, E., Study of Tuber. Among Young Women, N.T.A. Social Research Series No. 7.

HISTORY OF MEDICINE IN RAMSEY COUNTY

BY J. M. ARMSTRONG, M.D.

(Continued from August issue)

BIOGRAPHIES

William H. Morton

Dr. William Morton was a slight, gay, young man when he arrived in Saint Paul and became very popular. He had means, which perhaps was unfortunte for his professional career, as it prevented his attending strictly to business. He was a good diagnostician and a clever operator, and was considered in his day the foremost surgeon in the territory and state. He practiced first with Dr. Potts, then went into the drug business as he was too lazy, so it is said, to continue active practice. Not making a success of the drug business, he returned to medicine.

Doctor Morton's youth was spent in Paterson, New Jersey, and his medical education was probably obtained in New York. It is said his father was an Englishman and lived in Charleston, North Carolina, and that his mother died when he was a few weeks old. He was somewhat below the average in height and grew quite stout. He was appointed Surgeon to the First Minnesota Infantry, February 2, 1862, and resigned June 23, 1863, to become Medical Inspector of the 2nd Corps and shortly afterward returned to Saint Paul. About this time he was a partner of Dr. Alfred Wharton. Morton died in Saint Paul March 21, 1866, being about thirty-seven years of age. Doctor Morton seems to have been a very well informed man but his liking for liquor made him unreliable and indifferent to his work.

John Bernard Phillips

Dr. John B. Phillips was born near Kennet Square, Chester County, Pennsylvania, on March 23, 1821. His ancestors on both sides were Quakers and early settlers in that state under the patronage of William Penn. He graduated from the literary and medical departments of the University of Pennsylvania in 1855, having entered the institution in 1850, but spent two of the intervening years in Europe attending lectures at Heidelberg, Paris, and Vienna. He settled at Cottage Grove, Washington County, in 1855, afterwards coming to Saint Paul, where he died April 27, 1877. In 1854, while traveling abroad, he was arrested in Bael, Switzerland, on suspicion of being the Italian patriot, Joseph Mazinni, and was thrown into a narrow, damp, filthy cell and put on a bread and water diet for ten days. He maintained he was an American physician. To test him his captors asked him about yellow fever. He stated he had never seen a case. His interrogators then were sure he was not telling the truth as "was not yellow fever an American disease?" The explanation that his home was in

Philadelphia meant nothing. Finally, after an appeal to the United States Consulate, his identity was established and he was released.

Doctor Phillips was a member of the Ramsey County Society and of the State Association at its inception. Being a man of means and literary tastes, the daily drudgery of medical practice and struggle for a clientele did not appeal to him, hence he soon drifted away from it. He commanded a varied and thorough knowledge of literature, was versed in the classics, and was a master of the German, French, and Italian languages. He is described as a charming, cultivated and intelligent man. He was an intimate friend of Bayard Taylor, who was a student at the university with him. He was at one time a member of the Pension Board. In the Ramsey County Medical Library are a number of certificates of his attendance at the clinics at the Paris hospitals in 1853 and 1854; his membership certificate in the Minnesota State Medical Society in 1871, and a number of other items of his, among which are two federal licenses to practice medicine in 1866 and 1867. He was State Commissioner of Statistics in 1876-1877.

Azariah Theodore Crane Pierson

Dr. Azariah Pierson was known as "Father" Pierson by the Masonic Fraternity. He was born near Morris Plains, New Jersey, August 29, 1817. In 1837 he graduated in medicine at the old Barclay Street Medical School in New York. He came to Saint Paul early in 1851 in the employ of the Indian Department. For a number of years previous to 1885 he served as chief draughtsman in the office of the Surveyor General of Minnesota. It is doubtful whether he ever engaged in the practice of medicine, but for some years he was in the drug business in New York. He died in Saint Paul, November 26, 1889. The latter years of his life were devoted to Free Masonry. He became one of the most prominent Masons in the country. He was Grand Prior in the Supreme Council of the thirty-third degree Masons.

Russel Post

Russel Post came to Saint Paul in 1855. Assuming the prefix "doctor" he began doctoring by concocting medicines out of roots and herbs, but soon abandoned that practice and healed the sick by "laying on of hands." He had been a sailor, then a Connecticut peddler, and later dealt in real estate in Cleveland and in Cincinnati. His health failing he came to Saint Paul and took up the healing art. In the directory of 1856-1857 his residence is given as Pearl Street (West Fifth) between Washington and Franklin (East Twelfth Street was later also called Pearl Street). His name does not appear in the directory of 1858-1859. There was no directory published again till 1863 when Russel Post is listed as an electropathic physician with his office on Eighth Street, near Robert.

"Doctor" Post did a large and profitable business and treated his patients by placing one hand on the head and gesticulating with the other, at the same time keeping up a rapid talk on the benefits derived from the magnetic influences. He also took locks of his patients' hair and for a fee would undertake to give absent treatments, reaching the individual by holding the lock of hair in his hand, the whereabouts of the patient being a matter of no consequence. He was a venerable looking old fellow with white hair and long whiskers (in 1866) and an inveterate talker, always prying into other people's business and characterized as a nuisance by the regular profession.

"Doctor" Post was very acute in his business dealings and accumulated considerable property. He owned some land where Earl Street now crosses East Seventh Street which was known as "Post's Siding." Later, at the time of his death at about the age of sixty-five years, he was engaged in exploiting a mineral spring at Bald Eagle Lake and had started the erection of a Sanatoium. After his death, his daughter, Laura Post, continued his business and professed to hold communications with the spirits of the departed. She was not as successful as her father.

Thomas Reid Potts

Dr. Thomas Reid Potts was born in Philadelphia, February 10, 1810, and graduated at the University of Pennsylvania in 1831. He practiced at Nachez, Mississippi, and for ten years at Galena, Illinois, from 1841 till he came to Saint Paul in 1849. He was married at Fort Snelling in 1847 to Miss Abbe Steele, sister of Franklin Steele (who came to Minnesota in 1837) and Dr. John Steele, and was a brother-in-law of General H. H. Sibley. At the time the First Minnesota Regiment was recruited in 1861, Doctor Potts was the Medical Examiner. Josiah R. King was the first volunteer soldier to enlist for the war, so Doctor Potts examined the first volunteer soldier of the Civil War. As soon as King was pronounced fit, he was brought out and sworn into the service in the street in front of Doctor Potts' office.

During the war, Doctor Potts was contact surgeon at Fort Snelling, physician to the Sioux in 1850-1851, and medical purveyor of the District, and also was on the first Pension Board in Saint Paul. He resided for many years on Robert Street near Sixth in a small, white, one story, frame house. He was a small man of dark complexion and brown eyes with rather pronounced features. He was popular with all classes, a great story teller and somewhat of a politician, but unfortunately was not a good business man. At one time he attempted to practice in Duluth but his old political enemy, Dr. Thomas Foster, then editor of a Duluth newspaper, prevented to a large degree any success there.

Doctor Potts was elected president of the first Town Board in 1849, was city physician and health officer in 1860-1862, and again from 1866 till his death which occurred suddenly October 6, 1874. He was first president of the Minnesota Medical Society organized in 1853 and first president of the Saint Paul Academy of Medicine and Surgery established in 1860 and a founder of the Ramsey County Society.

Edward (or Edmund) G. Pugsley

Dr. E. G. Pugsley originally came from Ohio. Where his medical education was obtained does not seem to be known. He practiced at Neenah, Wisconsin, and must have moved to Stillwater in 1853 or 1854, though it is said he was there as early as 1850. He opened a drug store in Stillwater and practiced there till the war. He was Assistant Surgeon in the First Minnesota Infantry, and was later transferred to the Ninth. After the war, he practiced for several years at White Cloud, Minnesota, and in 1904 was living in Washington State.

According to a note in the Stillwater paper, Doctor Pugsley died in Tacoma, Washington, in January, 1931, at the age of eighty-three. It is also stated that he was at one time a partner of Dr. J. K. Reimer of Stillwater.

It is evident that father and son are confused by the Stillwater paper. The father was married in Saint Paul in 1852 and the son was admitted to the Ramsey County Medical Society in 1888. No doubt, it was the son who was living in Washington in 1904 and died in 1931.

William Ray

Dr. William Ray was born at Natchez, Mississippi, January 3, 1843. He graduated as Doctor of Medicine from the Missouri Medical College in 1868, though it is evident that he practiced medicine before that time as he was a surgeon in the Confederate Army. He came to Saint Paul after his graduation and remained there about three years when he moved to Delano, Minnesota. In 1889, he removed to Philipsburg, Montana, where he resided till the time of his death, March 18, 1909. At Philipsburg, he was surgeon to the Hope Mining Company and chairman of the Board of Health at the time of his death. He was very highly thought of in Montana. He was buried in Saint Paul.

Francis Rieger

Dr. Francis Rieger was born in Berlin, though part of his youth was spent in Magdeburg. He was educated in the former place where his father, Dr. Alexander Rieger, practiced medicine. Early in the fifties, he came to America and settled in Cincinnati. Three or four years later his younger brother, Paul, came from Germany and together they came to Saint Paul. Paul Rieger was a pharmacist and opened a drug store on Saint Anthony Street in the Empire Block, and later on the corner of Saint Anthony and Washington in the Winslow House. Dr. Francis Rieger was surgeon to the 8th Minnesota Regiment. After the war he located at Leavenworth, Kansas, or some place in Missouri, but returned to Saint Paul, remained there three or four years and then went to Omaha. How long he remained there is unknown, but on account of failing health he went to Denver and finally to Las Vegas, New Mexico, where he died probably about 1885. He left two children, a son and a daughter. He was born about 1831, being about thirty-one years of age when he went into the army.

Doctor Rieger was very German in his mental attitude, had a violent temper, and was impulsive and excitable. He suffered a great deal from some stomach disorder and perhaps this may have had its influence on his disposition. He had a predilection for surgery and did it well. His quick temper and lack of a sense of humor, however, often got him into trouble with his brother practitioners as he took offense when no discourtesy was intended. As an instance of surgical fees in the early days, one might mention that in 1858 he operated for a large parotid tumor. The operation was successful (the patient, a woman, lived till about thirty years ago). His charge was one hundred dollars, quite a sum for people in moderate circumstances, especially after the monetary panic of 1857. Surgical removal of the parotid gland was considered a very formidable operation at that time and only the most skillful and daring surgeons attempted it. Paul Rieger moved from Saint Paul to California where he established the well-known firm of perfume makers.

Gustavus Rosenk

Dr. Gustavus Rosenk was a peculiar character. His office was at one time on Saint Anthony Street near Hill in the lower part of the block, a grocery store being underneath it. In the directory of 1858-1859, his office and residence is given as Third Street between St. Peter and Wabasha. It is said he came from East Prussia and had been in the government employ in a civilian capacity as district physician some place along the Rhine. He came to America in 1851 or 1852, and to Saint Paul in 1855. Many stories were told about him which prejudiced the people against him. His first wife died suddenly of cholera it was said, and later his home burned down and one or two of his children burned with it. Later, one of his daughters died under peculiar circumstances and although an autopsy was done nothing ever came of it. These things, together with his unfortunate inability to make friends, added to his unfavorable reputation. He was appointed Senior 1st Lieutenant, Second Battery Minnesota Light Artillery, January 18, 1862.

After his return to Saint Paul, Doctor Rosenk had his office in his home on West Seventh Street between Seven Corners and Chestnut, about where Arbogast's Butcher Shop now is. Doctor Renz said when he was a boy he was afraid to go into Dr. Rosenk's garden because it was said he had a dissecting room there and kept a tame snake in his dingy little shop. Perhaps he fostered such a belief to keep small boys out. People seemed distrustful of him but he always maintained a dignified manner, carried a cane, and wore a silk hat, although often unshaven and untidy in dress. He was very poor and his practice was among the poor. He probably never obtained a medical degree, and was known as an irregular practitioner. He went to Oakland, California, about 1888 and died there.

Sylvester J. Sawyer

The place of Dr. Sylvester Sawyer's birth was probably Hookset, New Hampshire, but his place of residence from an early age was at Keeseville, Essex County, New York, where he is buried. He died in New York City, November 25, 1870, at the age of forty-two years. The Milwaukee, Wisconsin Directory for 1859 contains his name as a physician, but at the time he entered the army under contract, November 17, 1862, as Acting Assisting Surgeon, he gave his residence as Raymond, Wisconsin. He remained in the army till January 27, 1864, when his contract was annulled at his own request. His first wife died in childbirth, in about 1859. He married again at Raymond, Wisconsin, in 1862 and had several children by his second wife.

It appears that Doctor Sawyer graduated from the medical department of Columbia University in 1854, and spent some two years thereafter studying in Paris. The *New York Medical Register* for 1871 contains an obituary notice of Doctor Sawyer, but that volume is not available for reference here. Those few residents of Saint Paul, who have any recollection of him, state that he was a man of culture and good manners. He married his first wife in Saint Paul. She was a half-breed daughter of General H. H. Sibley.

(To be continued in October issue)

President's Letter

AFTER the summer let-up in medical meetings, during which time we reviewed our relationship with the University, and the State Board of Health, we turn again to the program of the month as outlined for the year. This month the program deals with the subject of accidents and their prevention.

September was selected because the annual figures show that there are more automobile accidents in September than in any other month of the year. It would be interesting to speculate on the reason why. Probably your guess is as good as any one's. The Safety Council suggests increased traffic due to vacationists returning to work, and also to a greater haste and a greater pre-occupation as fall and winter plans get under way.

The question of accident prevention is largely a lay matter, the doctors not having more than the expected percentage of accidents. Based on the fact that there is only one physician to every 1,000 lay persons, roughly speaking, only one in every 999 accidents involves a doctor.

The Minnesota Safety Council, with Col. Mattson as president, Mr. A. V. Rohweder as chairman of the Board of Directors, and Mr. C. H. Zeland as Executive Secretary, have accomplished a great deal in accident prevention, and we are indebted to them for much of the material in the packet of the month.

Mr. Rosenwald, director of Safety of the Minnesota Highway Department, has also cooperated with us in the accident problem.

The doctor becomes involved after the accident has happened. Our association has a fracture committee whose main objective for the year is improvement in the emergency care of fractures. This committee is particularly interested in the handling of the accident case before expert help arrives and gladly joins with the Safety Council in its campaign to prevent the moving of accident victims by untrained bystanders.

The committee is also interested in the even more serious problem of prevention of home accidents.

Accidents in the home result in more deaths and more serious injuries than do accidents on streets and highways and in industrial plants. It is an astonishing fact that this phase of accident prevention has received so little recognition.

Most of the deaths resulting from home accidents could be avoided and our September education campaign should lay special emphasis upon safety in the home.

George Earl, M.D., *President*
Minnesota State Medical Association.

EDITORIAL

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BUSINESS MANAGER
J. R. Bruce

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DEXTROSE AND INSULIN IN NONDIABETIC SURGICAL CASES

THERE is much of theoretical interest and practical importance in the clinical study of the metabolism of dextrose by nondiabetic individuals who are undergoing surgical procedures. The internist frequently is confronted with the question of the interpretation of glycosuria occurring after infusion of dextrose in treatment of surgical patients. The surgeon is interested in questions of the value of insulin and of dextrose in the treatment of certain postoperative complications, such as shock, acidosis and poor healing of wounds. Answers to these questions are found in an analysis of certain known facts concerning the tolerance of the organism for dextrose and the action of insulin in the nondiabetic organism.

According to data obtained from experiments on dogs and normal men, the individual having a normal ability to store and oxidize carbohydrate can receive dextrose by the intravenous route at the rate of about 0.85 gm. per kilogram of body weight per hour without excreting abnormal amounts in the urine. Thus, a normal man weighing 70 kg. should have no glycosuria if a liter of 10 per cent solution of dextrose was infused at a uniform rate during approximately two hours. The postoperative surgical patient, however, may exhibit for a variable period a diminished ability to utilize dextrose, for at least two reasons: (1) starvation, and (2) the surgical procedure itself, including the anesthesia. Obviously, there is no easy way of estimating the extent of this diminution in tolerance in any given case. Hence, the interpretation of glycosuria after infusion of glucose may be difficult and further investigation may be necessary before previously unsuspected diabetes can be definitely excluded. This investigation should consist of determination of the blood sugar after a night's fast. In cases in which doubt still remains, a dextrose tolerance test may be necessary. The patient on whom such a test is made should have fully recovered from the operation and, for several days before the test he should have been supplied with liberal amounts of carbohydrate food. In the routine management of patients after operation, however, it is possible to avoid raising a suspicion of diabetes unnecessarily if dextrose is infused at a rate well under the normal limit of utilization; that is, if a man is of average body weight it is well to take three to four hours for the infusion of a solution containing 100 gm. of dextrose. If glycosuria occurs repeatedly with such a rate of infusion, then diabetes must be strongly suspected.

In the four or five years following the discovery of insulin, in 1922, a large number of publications were concerned with the usefulness of insulin in surgical operations on nondiabetic patients. Treatment with insulin and dextrose was heralded by some as a specific in the treatment of surgical shock and postoperative acidosis. Early work which was thought to indicate diminished amounts of insulin in the tissues of dogs that had been subjected to ether anesthesia apparently provided a sound basis for the belief that insulin might be a valuable agent in postoperative treatment. Now, however, it is known that early assays of insulin in animal tissues other than the pancreas were erroneous for technical reasons, and thus some of the rationale for this use of insulin was lost. The number of publications on the surgical uses of insulin has decreased markedly in recent years.

The basis for the use of insulin in postoperative treatment seems to be the assumption that in treatment of normal individuals, as of diabetic patients, it results in the utilization of carbohydrate at a faster rate than would be possible if insulin were not administered. However, the experimental evidence for increased rates of utilization of dextrose by normal subjects under the influence of excess insulin is not striking. Furthermore, there are no clinical or experimental data available proving that production of insulin by the nondiabetic surgical patient is seriously impaired for any appreciable period. It is true that such individuals sometimes demonstrate ketosis and diminished dextrose tolerance. These may be due in part to temporary depression of production of insulin as a result of fasting. However, in most cases they can be rapidly overcome by administration of dextrose alone. Thus, with the possible exception of occasional cases in which severe ketosis and diminution in dextrose tolerance results from prolonged starvation, and certain special instances such as the temporary "diabetes" which may occur following removal of a hyperfunctioning tumor of the islets of Langerhans, there appears to be little indication for the use of insulin in treatment of nondiabetic surgical patients. When it is used, it should be administered with good judgment and careful laboratory control in order to prevent episodes of hypoglycemia which the patient might be poorly able to stand.

Randall G. Sprague, M.D.,
Fellow in Medicine, The Mayo
Foundation, Rochester, Minn.

OVERCROWDING OF THE MEDICAL PROFESSION

There are more physicians in relation to the population in our country than in any other country in the world. While the general population has reached a point where it is increasing very slowly, the figures show that in recent years some 5,500 medical graduates are turned out each year, whereas only about 4,000 physicians die. This means an increase yearly in this ratio.

There are some who would argue that no attempt should be made to curtail the number of medical students of the country and that expansion of equipment of medical schools to care for more of the applicants should not be discouraged, the law of the survival of the fittest being allowed to apply after graduation. They perhaps do not know that each year there are some 12,000 applicants to our medical schools, only about half of whom can be accommodated. Incidentally these 12,000 applicants average about three applications apiece, and one is known to have made as high as forty-one applications, to assure admission somewhere.

Overcrowding in business leads to cut-throat competition. In a profession it leads to commercialism, something that should not be in evidence in a profession, but which is always present to some extent and is increased with financial stress. This overcrowding is detrimental to the profession and the public.

According to Bevan,* in 1904 when the Council on Medical Education was created, there were some 28,000 medical students in the country. By increasing requirements and lengthening the Medical course, the number was reduced to 1,200 by 1920. The number has been gradually increasing since then to about 23,000 in 1935.

Far be it from us to advocate lengthening the present medical course, nor of making it more difficult. In order to reduce the number of medical students, the fairer way would seem to be in being more selective in accepting candidates for matriculation in the medical course, not only from the standpoint of scholarship, but from that of character and general fitness, difficult as this latter may be to evaluate.

In discussing the question of overcrowding, the status of the proportion of Jews in the medical profession arises. This subject is at present in the limelight in view of the persecution of the Jews in Germany and their immigration into this country.

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*Bevan, Arthur Dean: The overcrowding of the medical profession. Jour. Am. Med. Assn., 107:337, (Nov.) 1936.

According to Bevan, fourteen years ago 10 per cent of students in our medical schools were Jews. In 1935 the percentage had increased to 20 per cent, and Rabbi Lazaran has found that in 1933, 32 per cent of applicants for admission to the medical schools were Jews. With 42 per cent of all Jews in the United States located in New York City, the problem in New York state is particularly difficult. The medical schools in New York City can obviously not accommodate all the Jewish students, and many apply elsewhere. That there has not been obvious discrimination against Jewish applicants to medical schools in general, is indicated by the fact that whereas only 3.5 per cent of the general population of the country is Jewish, Rypins found 17 per cent ot medical students belonged to this race.

PULMONARY EMBOLECTOMY

THE operation of pulmonary embolectomy has now been performed with complete success in eleven cases, as follows:

Surgeon	*Date*	*Age*	*Sex*	*Reference*
Kirschner, M. (Konigsberg)	March 18, 1924	38	F.	Arch. f. Klin. Chir. 133:312-358 (Apr., 1924)
Meyer, A. W. (Charlottenburg)	Feb. 9, 1927	54	F.	Deutsch. Zeit. f. Chir. 205:1 (1927)
Crafoord, C. (Stockholm)	Sept. 23, 1927	54	F.	Acta. Chir. Scan. 64:172-186 (1928)
Nystrom, G. (Uppsala)	Feb. 4, 1928	35	M.	Acta. Chir. Scan. 64:110 (1928)
Meyer, A. W.	Feb. 10, 1928	n.s.	F.	Deutsch. Zeit. f. Chir. 211:353 (1928)
Crafoord, C.	Oct. 11, 1928	52	F.	Loc. cit. supra
Nystrom, G.	Jan. 23, 1929	46	F.	Ann. Surg. XCII:498-528 (1930)
Meyer, A. W.	Feb. 4, 1931	78	F.	Deutsch. Zeit. f. Chir. 231:586-592 (1931)
Crafoord, C.	Jan. 4, 1933	n.s.		Pers. comm. to. Lewis (see last ref.)
Valdoni, P. (Rome)	Nov. 27, 1935	68	M.	Policlinico (Sez. Prat.) 43:911-918 (May 18, 1936)
Lewis, Ivor (London)	Sept. 12, 1938	49	F.	Lancet, 1:1037-1041 (1939

Thus it will be seen that of the eleven operations, five (Crafoord-3, Nystrom-2) were done in Sweden, four (Meyer-3, Kirschner-1) in Germany and one each in Italy and England. The technic followed in all of them was practically that laid down by Trendelenberg in 1908, with the slight modifications suggested by A. W. Meyer after his first case.

The drawbacks to the performance of pulmonary embolectomy may be summarized as follows:

1. The diagnosis of pulmonary embolism is not always easy. Especially difficult is it, at times, to differentiate from coronary occlusion. Uremia has been mistaken for it and there are other possibilities. A wrong diagnosis has accounted for some of the unsuccessful attempts, resulting fatally.

2. Many patients with pulmonary embolism, even of severe type with most alarming symptoms, have been known to recover spontaneously and it is sometimes very difficult to evaluate these. Nystrom feels so keenly about this that he has laid down the dictum that no patient should be subjected to this operation unless death is obviously imminent. This rule has been meticulously observed in the eleven successful cases; indeed, in that of Mr. Lewis, he went so far as to wait, after opening the chest, for the patient to be in articulo mortis, before opening the pericardium and completing the operation.

3. There is one more drawback which will be mentioned very briefly, since it concerns only matters of surgical technic. The operation of Trendelenberg-Meyer presents no especial difficulty to a trained surgeon, but it entails the use of several special instruments. We believe that all of these can be dispensed with and the operation done with the instruments which are to be found in every hospital. Instead of using the special hook to pass a rubber tube through transverse sinus for the purpose of constricting the fused aorta and pulmonary artery during the incision into the latter and the removal of the clot, it would be much better, we think, to discard both the hook and the tube, passing the operator's left index and middle fingers into the transverse sinus and merely pressing the pulmonary artery with the ball of the left thumb. In this way, the most crucial point in the operation—the constriction of the aorta—is entirely avoided.

With the foundation that has been laid elsewhere we believe that it is only a question of time before we shall hear of some successful pulmonary embolectomies being done in this country, for with all the drawbacks that may be conceived there still remain some cases in which surgical intervention is unquestionably indicated; those where the diagnosis is clear, the patient free from severe intercurrent disease and evidently in extremis, a competent surgeon at hand and enough time before death ensues to make the few necessary preparations. In these circumstances we believe that a patient in such jeopardy is entitled to his one chance and that it is the surgeon's plain duty to give it to him.—*G.C.*

MISCELLANEOUS

THE BIRTH REGISTRATION LAW AMENDED TO MEET PRESENT SOCIAL NEEDS*

AMENDMENTS of the Minnesota birth registration law, enacted into law by the 1939 Legislature, of interest to physicians, particularly to those practicing obstetrics and to those holding the official position of local registrar in cities, shorten the attending physician's time of reporting births to local registrars from ten days to five days; provide that physicians shall report births of illegitimate children direct to the State Registrar, omitting their report to the local registrar, and that the State Registrar may make and file replacement or substitute certificates under certain conditions.

The amendment providing that the physician attending at the birth of a child born out of wedlock shall report that birth direct to the State Registrar, not to the local registrar as has heretofore been required, will enable the State Registrar to coöperate more fully with physicians in the distressing circumstances which sometimes attend the delivery of the unmarried mother. The amendment will also tend to do away with the falsification of birth records of illegitimate children. The impulse to falsify these records has been motivated by a desire to protect the mother and her family without thought for the welfare of the child. But the child because of his falsified birth record will have no identifying birth certificate until his real parents, and any other person who might be falsely named in the certificate as parent, as well as the person who falsified the certificate, go before the court so that it may make a finding of facts and order the recording of those facts—an inconvenient, embarrassing, and sometimes an impossible legal procedure, if all persons concerned are not available to testify.

The amendment providing for the reporting of births of illegitimate children direct to the State Registrar contains a clause requiring the State Registrar to send an abstract of the birth report to the local registrar. It does not specify when this abstract must be sent; unless the circumstances are extenuating it will probably be sent within a month after the State Registrar receives it. The present plan is to send the local registrar a memorandum containing the surname of the child, the sex, and the date of birth, with an order to enter the data in his index only, and to refer any person making inquiry about the record to the State Registrar. With the order will go a reminder that the penalty for divulging the fact that any child is illegitimate is a crime punishable by a fine or imprisonment. Since 1915 the law has stipulated that the birth certificate of an illegitimate child is a confidential record, and that a court order must be secured before the State Registrar or any local registrar may issue a certified copy of such a record, or disclose the fact of illegitimacy. It has stipulated also that the name of the putative father must be omitted from the certificate unless he consents to its inclusion. This last provision was made so that the certificate would be left blank concerning paternity pending a judgment of paternity in the district court when the father's name would be entered in the certificate.

The purpose of sending an abstract of the births of illegitimate children to local registrars is that if the registrar receives a request for the birth certificate of a person listed in his index for which he has no certificate in his files or register, he will know definitely that a birth record was made and where it is; hence, he will be able to direct the applicant to the State Registrar for a certified copy. A second and better reason for sending the abstract to local registrars is that it will help to insure complete reporting of births of illegitimate children. Usually the registrar knows when such a birth occurs. If he ought to have an abstract concerning it, but has none, he will suspect that the birth has not been reported and will notify the State Registrar, who will take immediate steps to see that a record is made and filed. Unless the local registrar is in a position to assist the State Registrar by checking completely on his district, births of some illegitimate children will go unreported.

Should circumstances surrounding the birth of a child be particularly distressing, at the physician's request the State Registrar's report to the local registrar may be delayed. The notation of the birth of an illegitimate child in the index of the local registrar will be inconspicuous. Should the register containing the index fall into unofficial hands, the notation will not be recognized as one that concerns an illegitimate child. Furthermore, should the child become legitimized by the marriage of its parents to each other, the notation in the index will be amended, and a complete birth certificate showing the child to be legitimate will be entered in the register in its proper place.

Other amendments affecting birth records of illegitimate children are patterned after the law of Maryland, a law which has worked out well in that state; one which has been adopted by a number of other states in the country. It provides that the State Registrar may prepare and file a new birth certificate for adopted children and for those legitimized by the marriage of their parents to each other. Thus, when the court has made a decree of adoption, the foster parents may file a certified copy of the decree with the State Registrar, who will prepare a new birth certificate containing the child's new name and data pertaining to the foster parents. The new birth certificate will be considered the child's birth certificate from the time it is made and officially filed. A certified copy of it will be prima facie evidence of the facts contained therein. The new certificate will not disclose the fact that the child is an adopted one. These new certificates for adopted children will be in the custody of the State Registrar only. They will not be filed with local registrars or with Clerks of the District Court. They will identify the child under its legal name and as the child of its legal parents. They will be available for use for school, passport, employment, to present with claims for the payment of insurance, for pensions, and for any other purpose for which a birth certificate may be required. The original birth certificate containing the facts of birth must be preserved in the office of the State Registrar, sealed and locked in a confidential file; the seal may be broken only upon written order of the State Registrar or of the court; and not inspected by anyone other than the State Registrar, or copied only upon order of the court.

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*Prepared by Gladys G. Casady, Assistant Director, Division of Birth and Death Records and Vital Statistics, Minnesota Department of Health.

Similar to the replacement certificate for the adopted child is the replacement certificate for the child legitimized by the marriage of its parents to each other subsequent to its birth. Although the law has for a good many years declared such children legitimate, their birth certificates have continued to carry the stigma of illegitimacy. It is true that since 1923 the law has permitted the father of a child legitimized after its birth to file an affidavit with the State Registrar declaring himself to be the father of the child and the husband of the mother. The law required that the affidavit be attached to the original birth certificate, the child's surname changed to that of its father, and a notation made on the certificate that the child was legitimized on a certain data. All these notations and additions were required to be made in red ink. A certified copy, if made, contained the original facts of birth entered in black ink, lined out in red ink, and finally, the additions and changes entered in red ink, thus making the sequence of events clear to the court or to other interested persons. If the original birth certificate contained as the name of the father, a name different from that in the affidavit of paternity and legitimation filed by the man who married the mother, the affidavit could not be accepted for the purpose of amending because it did not settle the question of paternity, rather, it contradicted it. Only the court can settle a dispute concerning paternity.

Under the provision of one of the recent amendments, if a man files an affidavit alleging paternity of a child, and that paternity contradicts the paternity contained in the original birth certificate, the court may hear all evidence and testimony, make findings concerning paternity, and order both a new certificate made to contain the facts as found and the State Registrar to substitute the new certificate for the original false certificate which is in his files. Should there be no dispute of paternity, the father may file with the State Registrar proof of his marriage to the mother and his affidavit declaring his paternity. Upon receipt of these documents the State Registrar may make a new birth certificate to replace the one in which the child was registered illegitimate. The State Registrar must, however, preserve the original certificate in a confidential file, and thereafter he may not issue a certified copy of that original, or permit inspection of it unless he has a court order to do so.

The amendments discussed thus far have been for the purpose of straightening out the predicament of the adopted child and of the child who has been legitimized by the marriage of its parents to each other. Another amendment provides that the State Registrar may certify to any part or parts of an original birth certificate, and that the certified part or parts shall be prima facie evidence of the facts set forth. This means that any person born out of wedlock, not adopted and not legitimized, may have a certified copy of relevant facts taken from his birth certificate for use for insurance adjustment, for employment, for passports, or for any purpose where the fact of legitimacy or illegitimacy is immaterial.

You may ask whether or not the amendments herein discussed will help or will further handicap the child born out of wedlock. From years of ineffectual attempts under the old law to save from embarrassment individuals born out of wedlock who need their birth certificates, registration experts know the amendments of the law will ease many a difficult situation. The increasing nation-wide necessity for birth certificates to establish the rights of individuals, financial and legal, makes it imperative that a birth certificate identify the child, and that pertinent parts of it may be certified to without embarrassment to the individual whose record it is. It makes it imperative also that all original data be preserved and that a complete record of the *facts of birth* be available, should the necessity for the presentation of those facts arise.

BLOOD-STREAM INVASION BY TUBERCLE BACILLI

Blood-stream invasion by tubercle bacilli may take place at any stage of tuberculosis and at any age; following the primary infection; during the evolution of the disease or as a terminal event. The stage of the disease influences considerably the incidence of implantations in the various organs of the body; the age of the patient plays a minor rôle. Chronic forms of hemotogenous tuberculosis are uncommon in children only because, as a rule, they do not live long enough for the protracted manifestations of the disease to develop. When tubercle bacilli invade the blood-stream there may result a generalized miliary tuberculosis that overwhelms the patient in a few months or there may be a complete absence of symptoms or any variation between these two extremes. The numbers and virulence of the tubercle bacilli, the frequency of invasion, the portal of entry and the sensitivity of the body to tuberculotoxins will determine the issue.—Tubin, Eli H., Amer. Rev. of Tuber., 1939, 39.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
W. F. Braasch, M.D., Chairman

WAS THE SURVEY ON THE SUPPLY OF MEDICAL CARE WORTH WHILE?

Many physicians who took part in the recent Survey of the Supply of Medical Service which was conducted by the various county medical societies of the state and nation have wondered about the results accomplished. Undoubtedly many who took the time and effort to fill out the blanks sent to them wondered whether their efforts created data which were worth while. Those who threw the blanks into the waste basket are probably satisfied that they were not. *However, the latter group were wrong.*

Inadequacies Revealed

The completion of an immense undertaking such as the National Survey proved to be is necessarily slow and laborious. The results of the Survey are still coming in from states that were delayed in making it. However, a final summary of the data accumulated will soon be forthcoming from the Bureau of Medical Economics. Those who were interested enough to read the series of resumés of the Survey in different counties published in the organization section of the *Journal of the American Medical Association* were well repaid for their efforts. Not alone was an inventory given of medical care in the respective counties such as never appeared before, but the reports revealed inadequacies in certain fields and pointed out methods of correction and improvement which should be of great value to the public welfare of the areas involved.

Cook County Appraisal Thorough

An example of thoroughness and intelligent appraisal of the supply of medical care was revealed in the report made in Cook County by the Committee on Medical Economics of the Chicago Medical Society. For thoroughness and intelligent consideration of the problems involved this report stands out as a shining example of what could be accomplished through a Survey made by physicians coöperating with agencies allied in the care of the sick. The difficulties encountered in conducting a survey of this kind in a community like Chicago are self-evident. Too much praise cannot be given to the members of this committee, headed by the well known urologist, Dr. Herman Kretschmer.

System Meets Demand

In the introduction to their report they called attention to the difference, which was suggested by Miss Josephine Roche, between *active demands* and *actual needs* of medical care. The difference between these terms is considerable. The committee's most important and final conclusion was that the supply of medical care in Cook County was sufficient to meet the *active demand* for all urgent requirements. This very important conclusion was arrived at only after a most thorough and painstaking search for facts, made by physicians with the aid of all allied agencies as well. The results of this investigation should help to answer the criticism so frequently made that the present system of distribution of medical care is inadequate to meet the demands of the community.

Important Needs Uncovered

Although this Survey revealed that the supply of medical care was sufficient to meet the active demands of the community, the committee was convinced that many very important needs exist. We quote from their report as follows:

"Our ideal must be to provide complete medical care, including both active demands and actual needs, for all who should have it. To achieve such an ideal means the formulation of measures which will provide medical care for the entire population at some periods in their lives, including those who seek it actively in addition to those who do not realize, and those who are unable to recognize their own needs for it, and those who will not accept it. *The accomplishment of such a program requires continuous and progressive improvement with respect to professional technics and mental attitudes of all who participate in giving any part of complete medical care. To this end, as the plan develops, the public at large must realize and evaluate the nature of this effort, its difficulties and successes. Thus there is emphasized the importance to all of public relations on a broad and sincere basis and of general education."*

Education Required

They emphasize the fact that lack of medical care which may exist is based on ignorance on the part of the public as to its needs. It has been reliably stated that 10 per cent of the population does not wish medical care. *The greatest need shown by the study is expressed by the one word "education."* Education includes not only that of the medical profession itself, but of all the professions and technical groups having to do with health activities, as well as the education of the general public.

For Profession and Public

A. Education of the professions giving medical care is specifically recommended. The desirability of coöperation with the pharmaceutical profession is referred to. They emphasize one objective, namely the reduction of expense of medication from unwarranted prescription of proprietary preparations.

B. Education of the public particularly, and the appointment of a Committee on Education in regard to Medical Care.

C. Stimulation of college and university faculties to include health education in their curricula.

Nation-wide Program Recommended

The Committee favored the institution of a continuous nation-wide program of education of the general public by a Committee on Education in Regard to Medical Care, with an active membership and a full time secretary. All members of this Committee should have the broadest human interest and sympathy, in addition to exceptional professional qualifications. The profession should promptly undertake devising ways and means of providing individual physicians available to the medically indigent and those in the lower income groups.

For a Coördinated System

Under Hospital Needs, they recommend:

1. That all government hospitals in Cook County except state and federal hospitals be administered by a single metropolitan hospital commission. The committee believes the chaotic hospital system in Chicago and Cook County is the direct result of absence of a coordinated hospital system under a single controlling body.

2. More widespread distribution geographically of facilities, using as far as possible existing hospital and clinical facilities, by government subsidy if necessary.

More Subsidized Beds

3. More subsidized beds for children and maternity cases, and additional beds for colored patients, for patients with active tuberculosis and nervous and mental diseases.

4. More facilities for the care of chronic and incurable patients, not necessarily in hospitals.

They call attention to the persistence of a higher tuberculosis mortality rate for the county and the state of Illinois and the fact that the death rate for this disease has decreased very little during the past six years.

5. All unapproved hospitals to be brought up to standard to secure admission to the list of registered hospitals.

Public Ambulance Service Advocated

6. The Public Ambulance Service Plan should be adopted, which would expedite emergency care. The deplorable lack of an organized emergency ambulance service in the City of Chicago materially enhances the hazards for accidents in this area.

The committee calls attention to the well-known need and present lack of *nursing care* to be provided for the sick in their homes. Particularly is this true of low cost practical nurses. Regulation and control of training of such nurses should be supervised by organized medicine. It would seem that if the government really wishes to be of help to the sick with low incomes, there would be no more practical way than to develop this type of nursing and subsidize it.

Agency for Needy Patients

The next proposal is of considerable importance, namely that the office of the Chicago Medical Society should include a *Department of Medical Care.* The director of this department should receive reports of persons in immediate need of medical care which they cannot secure and investigations should be made, with a view to adjustment. This department would assist welfare agencies and other organizations about any phase of medical care. To this committee any information about any phase of medical care would be brought, and conditions suggested which might be improved by the action of the Medical Society.

For Supervised School Health

The large field of health services in the schools should have the continuous and considered attention of the medical society, through a standing committee. To them should be given the responsibility of providing progressive leadership in this field, including the public, parent-teacher associations, and the school personnel.

Ironic Contrast

In contrast to this thorough, painstaking appraisal of the health situation and the intelligent recommendations for improvement submitted by the Chicago and many other County Medical Societies, look at the inexact methods employed by the Federal Government in formulating the so-called National Health Program. Based on slip-shod, ridiculous methods of investigation, and on the visionary plans of health theorists, it is moulded in a form so as to have the greatest political and sentimental appeal. It is for such indefinite proposals that hundreds of millions were requested in the Wagner Health Bill, without any exact ideas as to needs. *If the Federal Health authorities really wished to find out where the greatest needs actually exist and the best way to solve the problems involved, they would consult and work with physicians and their organizations, who know. Have they done so? Tragically, and ironically, No!*

ADVANCE NOTICE

Commentators on legislation passed by the 76th Congress are nearly all of one mind on the question of future enactments on health.

They are certain that the 77th Congress will see great expansion of public health services. Political dopesters see health legislation in the platforms of Republicans as well as New Deal Democrats. They foresee that the new Federal Security Chief, Paul V. McNutt, will bend his energies principally to the expansion of Social Security services to include more health service as one sure bid to popular favor.

Senator Robert Taft, while proceeding cautiously so as not to give offense to conservative opinion nevertheless ventured to make the following suggestion at the laying of the corner stone of the new Doctors' Building in Washington.

"Federal Aid Can Be Worked Out"—Taft

"There is hardly a field in which there has been more sensational and continuous improvement than that of medicine in the United States. That improvement has been due to the brilliant, unselfish and industrious work of thousands of physicians. It is not their fault that incomes are unequally distributed and that efforts by local governments to cover the entire field of health have been restricted by lack of resources. *But now I hope they will take an active interest in seeing that the unequalled medical service received by most Americans is extended to the entire population.* Their own interest and participation in the program will make it certain that it is not dominated by half baked theorists or by those who believe in a totalitarian state, directing the lives and caring for the health of all of its citizens through the mechanical and usually careless action of government bureaus. I believe a federal aid program can be worked out. I believe it can be much simpler and much more economical and much more likely to preserve the essential independence of the doctors than the present Wagner bill. I believe it can be worked out with the assistance and coöperation of the doctors themselves."

In a recent issue of the *United States News* the following paragraph appeared:

"The next drive to expand the Social Security system will be to incorporate a public health program. Top social security administrators believe Congressmen can be persuaded to vote liberal funds for expanded health services."

May Need Publicly Supported Facilities—U. S. Public Health Service

In a current statement by the United States Public Health Service issued to mark its removal from the treasury department to the new Federal Security Agency there is the following observation:

> . . . "Recent enactments of Congress reflect the changing concepts of the field of public health and the changing emphasis on the various activities—from general quarantine and sanitation measures to the provision of adequate health facilities for all the people—from diseases already so successfully reduced and controlled by modern sanitary and other public health measures, to those heretofore unattacked or unsuccessfully combatted such as venereal diseases, cancer, heart disease and other chronic conditions of the older age group. Not that earlier basic measures are neglected; for in some instances, as in the case of yellow fever, it has recently been found necessary to extend quarantine inspection activities, especially as the result of speedy airplane travel and the existence of foci of jungle fever in South America and the possibility of animal reservoirs and as yet unknown vectors of the disease; but rather greater attention is now being paid to the extension of health facilities and to research in fields which offer greater hope and promise of reduction of disease and suffering. *It is now realized, also, that adequate medical care for large numbers of our population cannot be provided without a greater measure of public subvention.* By reason of an inherent interest in the problem, fundamental organization and medical knowledge, the health organizations, Federal and State, are the best qualified and equipped agencies to take leadership in reducing the amount, severity and economic consequences of illness. *To be effectual, this leadership may, in the future, of necessity include in the public health program, the operation of publicly supported facilities and services in which medical care and other means for the improvement of human health and welfare provide the central purpose;* and provision for this activity in the field of health advancement may be interwoven into the future pattern of public health."

Many Experiments

Meanwhile in many states and counties a variety of plans for payment of medical bills are in process of organization under medical sponsorship. They range from so-called coöperatives to cash indemnity insurance and will in time provide useful figures based upon experience on which to estimate their feasibility and worth.

Until this information is available, however, there is every reason for avoiding any health legislation that will include even a medically sponsored program for health insurance.

Physicians everywhere may congratulate themselves, therefore, that no action was taken at this session of Congress on the Wagner bill S 1620; but their task has just begun.

Friends and foes, alike, must be made aware of the fallacies and futilities that lie ahead of government "subvention" in the actual care of the sick. There will undoubtedly be increased appropriations for health services. It is the responsibility of organized medicine to see that those appropriations are made available where they are needed most and that they do not operate to fasten compulsory health insurance, European plan, upon Americans.

FAMILY DOCTOR—MYTH OR REALITY?

A new and subtle challenge to defenders of the private practice of medicine has just been launched by the redoubtable Mr. Michael M. Davis, chairman of the Committee on Research in Medical Economics, in a recent issue of the *Survey Graphic.*

The chief assets of our American system of medicine are the free choice of physician which it permits and the preservation of a personal relationship between patient and physician.

These two assets were cited by the House of Delegates of the American Medical Association as essentials to good medical service which would be lost under any system of compulsory government medicine.

Basing his observations on a study of 365 New York families just above the relief level, Mr. Davis declares that the realities do not correspond to this official and imaginative description of our American system.

Choice "Haphazard"

In his sample of low income families the family doctor was practically non-existent, Mr. Davis says; there was no personal relationship of any permanent character between the patient and his doctor and, in the course of a year, medical services needed by a family were usually secured in a haphazard and uncoördinated fashion.

Furthermore, he hazards the guess, based chiefly upon personal observation in the course of his studies, that the family in the upper income brackets is likely to have—not one family doctor who in turn guides them to specialists as needed—but four or five specialists more or less haphazardly selected. Only the children in charge of a pediatrician have anything resembling a coördinated service.

What Do They Know at Vassar?

And as to free choice—he says choice of any kind is made difficult because of the difficulty of getting at lists of qualified physicians. "You can find out if you know the ropes," he says, "but how many graduates from Yale or Vassar would know the professional ropes"?

The answer to this study is obvious. The fact that free choice of physician is not always wisely used and that the personal relationship between patient and doctor does not always operate to its most beneficent extent does not, of course, invalidate the principles of free choice and personal relationship. Neither does it cast doubt upon their importance to Americans.

Education Needed

As a matter of fact, the conditions discussed by Mr. Davis probably exist in the largest cities, only, and scarcely at all in the smaller communities and the rural districts.

On the other hand, better general education in existing aids to an intelligent choice is undoubtedly needed. Such education should also include much greater emphasis on the rôle of the permanent family advisor as the highest development of medical service and the essential factor in coördinated medical service.

NEW PROBLEMS IN RELIEF

There are difficulties ahead for administrators of relief in the next few months and, presumably, also for physicians who take care of relief clients.

The relief appropriation for the biennium, 1939 and 1940, has been reduced and available funds will be still further depleted if any large number of WPA employees are returned to direct relief.

Furthermore, there is a new relief administration at the capital. Following the plan of the Re-Organization Bill, the old SRA was destroyed and a new Division of Social Welfare, part of a new Division of Social Security came into being. The division has a new administrator, Mr. Walter W. Finke, whose assistant is Mr. William H. Crowe. Both are well qualified for the work but new to their jobs. Many experienced staff members are gone and in their places are recent appointees who must learn all the details of their complicated tasks.

Confusion Probable

There is every reason to believe that Mr. Finke and his Department as well as Mr. Carl H. Swanson, new head of the Division of State Institutions, will coöperate closely with the medical profession. But it is quite possible that there will be confusion and misunderstandings before the new division is fully organized and running smoothly.

It is possible, also, that the new administration will not be familiar with medical policies and precedents in Minnesota and will need the same assistance that was given to FERA and SRA heads by the Council in the early days of relief in Minnesota.

Total Mounts

The total number of persons benefitting by relief, WPA employment or Social Security Aids in Minnesota is still appallingly high. The approximate figure is 491,000 and that total does not completely cover Farm Security clients, CCC enrollees, or recipients of NYA aids.

The immediate interest of the physician in this problem concerns provision of essential emergency medical aid for these people. He must see that they get the care they need and also that sound principles of medical practice are safeguarded.

Unique Legislation

Close contact will be maintained with division heads by the Council and the State Office. Individual physicians in their home communities must work closely with county welfare boards, also, in the solution of local problems of relief.

In many respects the Minnesota State Medical Association finds itself confronted with almost the same task that confronted the Council of the association a few years ago.

But there is this important difference: essential legislation giving the relief client his choice of physician is on the statute books, an accomplishment which is unique among most states of the country.

THE NUISANCE SUIT

(Monthly Editorial Prepared by the Medical Advisory Committee)

The American people have become insurance-minded to the highest degree. There are very few either real or anticipated catastrophes that cannot be insured against, and there are very few of the events of life in which insurance benefits cannot play a part.

The fact that indemnity insurance is so prevalent, of course, makes for litigation—litigation based on real or fancied wrongs or injury to property or person.

Your Medical Advisory Committee divides malpractice litigation, in which we are particularly interested, under three general heads:

1. That due to a genuine injury committed by the defendant in the suit, to the person of the plaintiff.

When a real injury has been committed, the suit should be settled at once. There is nothing gained by a long, expensive trial. However, the facts must not be open to question and they must plainly show the defendant guilty of the alleged wrong doing.

2. A fancied wrong committed by the defendant to the body of the plaintiff.

The case of the fancied wrongful act is usually the one brought for large amounts. Here the facts in the case do not show any just cause for action and are based solely on the hopes, not so often of injuring the reputation of the physician involved, as on the wish to obtain money from the insurance company. These cases should be fought to the limit and every recourse in the courts exhausted before any damages are paid.

3. The nuisance suit brought in the hope of obtaining either a small amount of money or nullification of the account owing for professional services.

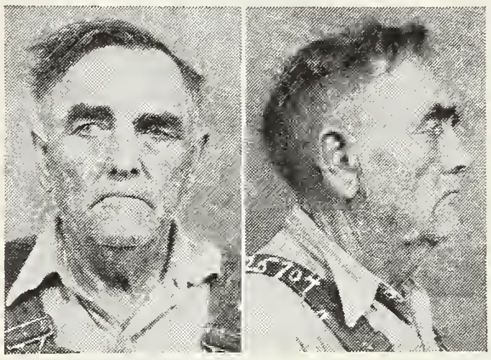
A nuisance suit is an annoying attempt to vilify the good work of a physician by one who is of unscrupulous character, not only in his dealing with medical men, but in all his dealings in business and commercial life. Indemnifying insurance companies should not too readily compromise these cases. One settled in this way leads to other "trumped up" cases—a vicious circle for which all holders of insurance pay.

Insurance should in most so-called "malpractice cases" defend, not indemnify.—B.J.B.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Saint Paul Abortionist Given 10 to 15 Year Prison Sentence

Re. State of Minnesota vs. Peter H. Nellessen.



Peter H. Nellessen, sixty-eight years of age, 1054 Western Avenue, Saint Paul, married and the father of six children, was sentenced to a term of not less than ten and not more than fifteen years at hard labor in the State Prison at Stillwater, on July 25, 1939, by the Honorable Kenneth G. Brill, Judge of the District Court for Ramsey County. Nellessen entered a plea of guilty to an information charging him with the crime of manslaughter in the first degree following the death of a twenty-eight-year-old, married, Saint Paul woman on July 19, 1939. Nellessen had performed a criminal abortion upon the deceased on July 3, 1939, for which he admittedly received the sum of $15.00.

Nellessen served a previous term of three years in the State Prison at Stillwater, following his plea of guilty, in Saint Paul, in July, 1935, to an information charging him with the crime of abortion. Nellessen holds no license to practice any form of healing whatsoever in the State of Minnesota. He stated that about forty years ago he worked for a number of years as a male nurse at the Soldiers' Home at Minnehaha Falls. He gave his occupation at the time of his arrest as a stone mason. According to the records of the Bureau of Identification of the Saint Paul Police Department, Nellessen has six previous convictions on various liquor law charges, the sentences ranging from five months in the county jail, to eighteen months in the Federal Penitentiary at Leavenworth, Kansas.

Spring Valley Woman Pays $100 Fine for Illegal Practice of Healing

Re. State of Minnesota vs. Elizabeth Schulz.

On August 14, 1939, Elizabeth Schulz, forty-seven years of age, entered a plea of guilty before the Honorable Norman E. Peterson, Judge of the District Court, at Preston, Minnesota, to an information charging her with practicing healing without a basic science certificate. Following a statement of the facts to the Court, Judge Peterson sentenced Mrs. Schulz to pay a fine of $100 or to serve thirty days in the county jail of Fillmore County, in the event the fine was not paid. Mrs. Schulz promptly paid the fine.

Mrs. Schulz was arrested following the filing of a complaint against her by Mr. Brist on behalf of the Minnesota State Board of Medical Examiners on August 11, 1939. The investigation made by the Medical Board disclosed that Mrs. Schulz had been seeing numerous patients at her home in Spring Valley where she attempted to diagnose and treat their ailments. Mrs. Schulz would charge each patient 50 cents per call, and in addition to administering a sort of massage treatment, she would write out a prescription on the prescription blanks of the Sward-Kemp Drug Store at Spring Valley, Minnesota, for such drugs and medicines as she thought the patient should have. While Mrs. Schulz did not sign these prescriptions she had an understanding with Mr. E. B. Petersen, a part owner of the drug store, that they would be honored. Other equipment used by Mrs. Schulz, in her practice, consisted of a stethoscope, numerous dressing forceps and other similar articles.

Mrs. Schulz has a previous conviction for a similar offense in the same court in 1934, and at that time was sentenced to three months in the Fillmore County Jail, but the sentence was suspended and she was placed on probation. At that time Mrs. Schulz was selling a mineral food. On January 10, 1934, one Russell Prinsen, nine years of age, died of diabetes. Russell had been under Mrs. Schulz' care and was taking this mineral food. Mrs. Schulz promised Judge Peterson then that she would refrain from practicing healing in any manner in the future. However, she again resumed the practice which resulted in her arrest in the present case. When Mrs. Schulz was arraigned before Justice Fraser at Preston, Minnesota, on August 12, 1939, she waived her preliminary hearing and was held to the District Court. She indicated a desire to enter a plea of guilty and have the matter disposed of at once, which was done.

It is to be hoped that two prosecutions have convinced Mrs. Schulz that she cannot engage in the practice of healing in any manner in the State of Minnesota. The only training that Mrs. Schulz has ever received along these lines, is a short time as a student nurse some twenty-five years ago, at the State Hospital at Fergus Falls. Mrs. Schulz had in her possession at the time of her arrest, a diploma from the Weltmer Institute of Suggestive Therapeutics at Nevada, Missouri, which was dated July 28, 1933. This diploma purports to confer upon Mrs. Schulz the right to make practical application of Suggestive Therapeutics. She stated that she attended this school in the summer of 1933 for a period of four weeks and that the tuition fee was $50. Mrs. Schulz, and her lawyer, stated to the Court that Mrs. Schulz would absolutely refrain in the future from practicing healing in any way, shape or manner. The Medical Board feels that Mr. Petersen's connivance in the operation of this scheme by Mrs. Schulz, is not to his credit as a registered pharmacist, and is a violation of the laws of this state. Mr. Petersen was also advised that any further violation of the medical laws of this state on his part, will result in the prompt filing of a complaint by this Board.

The State Board of Medical Examiners wishes to acknowledge the friendly and courteous coöperation of Mr. Clarence T. Perkins, County Attorney of Fillmore County, in the prosecution of this case.

PHYSICIANS LICENSED ON JULY 6, 1939

June Examination

Barnett, Joseph Morton, U. of Minn., M.B. 1938, Minneapolis, Minn.

Birnberg, Victor Jack, U. of Minn., M.B. 1938, Minneapolis, Minn.

Blackwell, William Joseph, Northwestern, M.B. 1935; M.D. 1936, Rochester, Minn.

Blomberg, Robert David, U. of Minn., M.B. 1939, Flint, Mich.

Brooke, James William, U. of Ore., M.D. 1938; Lancaster, Minn.

Burks, James Willis, Jr., Wash. U., Mo., M.D. 1937, Rochester, Minn.

Christiansen, Harold Aug., U. of Minn., M.B. 1938; M.D. 1939, Minneapolis, Minn.

Coulter, Everett Benjamin, U of Minn., M.B. 1939, Minneapolis, Minn.

Coventry, Markham Bingham, U. of Mich., M.D. 1937, Rochester, Minn.

Craig, David Mark, U. of Minn., M.B. 1939, Wauwatosa, Wis.

Cronin, Donald Joseph, U. of Minn., M.B. 1939, Minneapolis, Minn.

Douglas, Kenneth Wallace, U. of Minn., M.B. 1939, Tacoma, Wash.

Engstrom, William Weborg, U. of Minn., M.B. 1939, Minneapolis, Minn.

Fink, Daniel Louis, U. of Minn., M.B. 1938, Minneapolis, Minn.

Fogarty, Charles William, Jr., U. of Minn., M.B. 1938, St. Paul, Minn.

Forsythe, James Robert, U. of Minn., M.B. 1939, Brooklyn, N. Y.

Fredricks, Merriam Gerard, U. of Minn., M.B. 1939, Wauwatosa, Wis.

Goehrs, Gilman Henry, U. of Minn., M.B. 1938, St. Cloud, Minn.

Haisten, Arnold Sessions, U. of Pa., M.D. 1936, Rochester, Minn.

Hampton, Hiram Phillip, Emory U., M.D. 1937, Rochester, Minn.

Hay, Lyle Joseph, U. of Minn., M.B. 1937; M.D. 1938, Minneapolis, Minn.

Heckel, Donald Q., U. of Minn., M.B. 1939, San Bernardino, Cal.

Jacobson, Charles Edward, Jr., Cornell U., M.D. 1935, Rochester, Minn.

Jacobson, Wyman E., U. of Minn., M.B. 1939, Flint, Mich.

Kaplan, Harry Arthur, U. of Minn., M.B. 1937, Duluth, Minn.

Kelly, Clarence Andrew, Marquette U., M.D. 1939, Dresser Junction, Wis.

Kelsey, Chauncey Miller, U. of Minn., M.B. 1939, Hinckley, Minn.

Koskela, Lauri Edwin, U. of Minn., M.B. 1938, Coleraine, Minn.

Lindert, Merlyn Carl Fred, U. of Minn., M.B. 1938, Wauwatosa, Wis.

Lindley, Stanley Bryan, U. of Minn., M.B. 1938, Minneapolis, Minn.

MacMillan, David Glenn, U. of Minn., M.B. 1939, Duluth, Minn.

MacPherson, Malcolm Morrison, U. of Manitoba, M.D. 1935, Rochester, Minn.

Magner, Charles Edgar, Rush Med. Col., M.D. 1938, Malta, Mont.

Monserud, Nels Ordell, Rush Med. Col., M.D. 1938, Cloquet, Minn.

Mooney, Robert Davis, U. of Minn., M.B. 1938, St. Paul, Minn.

Morrison, William Forster, U. of Minn., M.B. 1938, Minneapolis, Minn.

Musachio, Nicholas Frank, U. of Minn., M.B. 1938, Eden Valley, Minn.

O'Leary, John Hall, U. of Minn., M.B. 1938, Minneapolis, Minn.

Phalen, George Smith, Northwestern, M.B. 1937; M.D. 1938, Rochester, Minn.

Raszkowski, Harvey Joseph, U. of Wis., M.D. 1936, Rochester, Minn.

Richardson, Robert Joseph, U. of Minn., M.B. 1938, Rushford, Minn.

Satory, John Joseph, U. of Minn., M.B. 1938, Wabasha, Minn.

Schwyzer, Hanns Carl, U. of Minn., M.B. 1938, Saint Paul, Minn.

Selmo, Joseph, Loyola U., M.D. 1939, Caspian, Mich.

Sickels, Edward Worman, U. of Minn., M.B. 1939, Detroit, Mich.

Stewart, Marvin Jerome, U. of Minn., M.B. 1939, St. Paul, Minn.

Stoen, Harold Jennings, Rush Med. Col., M.D. 1936, Cleveland, Ohio.

Swenson, Orrin Endre, U. of Wis., M.D. 1938, Stoughton, Wis.

Trow, James Edward, U. of Minn., M.B. 1939, New Orleans, La.

Veranth, Leonard Anthony, Marquette U., M.D. 1939, Ely, Minn.

Weisman, Sydney Jerald, U. of Minn., M.B. 1939, Buffalo, New York.

Weismann, Rodger E., U. of Iowa, M.D. 1938, Houston, Minn.

Westrup, John Edward, Marquette U., M.D. 1939, Maple Lake, Minn.

Williams, Bill Henry, U. of Minn., M.B. 1937; M.D. 1938; Minneapolis, Minn.

Williams, John Alexander, U. of Minn., M.B. 1939, Duluth, Minn.

Zinter, Ferdinand A., U. of Minn., M.B. 1938, Minneapolis, Minn.

By Reciprocity

Clark, Richardson Evans, U. of Iowa, M.D. 1936, Spring Valley, Minn.

Eyres, Thomas Edward, U. of Iowa, M.D. 1932, Pequot, Minn.

Pewters, John Thomas, U. of Minn., M.B. 1937; M.D., 1938, Minneapolis, Minn.

Witherspoon, Jackson Thornwell, Johns Hopkins U., M.D. 1928, Minneapolis, Minn.

National Board Credentials

Cunningham, Bernard Poland, New York Univ., M.D. 1936, Rochester, Minn.

Olson, Lorin Magnus, Northwestern, M.B. 1938; M.D. 1939, Chisago City, Minn.

◆ REPORTS and ANNOUNCEMENTS ◆

MEDICAL BROADCAST FOR SEPTEMBER

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 11:00 o'clock every Saturday morning over Station WCCO, Minneapolis (810 kilocycles or 370.2 meters) and Station WLB, University of Minnesota (760 kilocycles or 395 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota. The program for the month will be as follows:

September 2—Cause of Accidents
September 9—First Aid
September 16—Accidental Infection
September 23—Shock and Hemorrhage
September 30—Injuries of the Teeth and Jaws

INTERNATIONAL ASSEMBLY OF THE INTER-STATE POSTGRADUATE MEDICAL ASSOCIATION

This year's International Assembly of the Inter-state Postgraduate Medical Association of North America will be held in the Palmer House, Chicago, October 30 and 31 and November 1, 2 and 3.

This assembly has been for a number of years one of the outstanding medical meetings of national and even international scope. A full program of clinics and addresses has been arranged for morning, afternoon and evening of the five days of the assembly. The dinner scheduled for Wednesday evening will be addressed by Major General James C. Magee, surgeon-general of the United States Army, and Major General Ross T. McIntire, surgeon-general of the United States Navy, with Dr. George W. Crile, president of the assembly, master of ceremonies.

Professor Dott. Emanuele Momigliano of the Department of Obstetrics and Gynecology of the Royal University of Rome and Dr. Alva H. Gordon and Dr. John R. Fraser of McGill University constitute the visitors from beyond the bounds of the United States.

Outstanding teachers and clinicians from medical centers throughout the country will provide a full program of interest and practical value, not only to the specialist, but also to the general practitioner. Those who have attended one of these meetings know the high caliber of the programs.

The Saturdays preceding and following the assembly will be devoted to clinics in the Chicago hospitals. Chicago's hospitals, hotels and central location make it particularly suitable for a large meeting of this kind. All physicians in good standing with their state or provincial societies are cordially invited to attend. A nominal registration fee of $5.00 admits to all the scientific meetings.

Members of the profession are urged to bring their ladies as an excellent program is being arranged for their benefit by the Ladies' Committee.

A program is being mailed to all physicians in good standing in the United States and Canada.

On page xix of the advertising section of this number of the JOURNAL appears a list of the teachers and clinicians who are to take part in the program of the assembly.

Dr. George W. Crile is president and chairman of the program committee this year and Dr. Chevalier Jackson is president-elect. Dr. William B. Peck, Freeport, Illinois, is managing director.

GRADUATE FORTNIGHT—NEW YORK ACADEMY OF MEDICINE

The twelfth annual Graduate Fortnight of the New York Academy of Medicine, this year devoted to the subject of the Endocrine Glands and Their Disorders, will be held October 23 to November 3, 1939.

Sessions will consist of morning Round Table Conferences and evening lectures at the Academy headquarters and afternoon clinics at various hospitals. The program contains the names of outstanding authorities in this country and Canada on Endocrinology.

Copies of the program and further information may be obtained by writing the New York Academy of Medicine, 2 East 103rd Street, New York City.

1940 STATE MEETING

The next annual meeting of the Minnesota State Medical Association will be held in Rochester, Monday, Tuesday and Wednesday, April 22, 23 and 24, 1940. The Council and House of Delegates will meet on Sunday, April 21. Scientific sessions will be held in the new Rochester Auditorium. Dr. F. J. Heck, Rochester, is chairman of local arrangements.

In Memoriam

Benjamin W. Kelly

1874-1939

DR. B. W. KELLY died very suddenly at his home in Aitkin, Minnesota, June 4, 1939, at the age of sixty-five. He had suffered from poor health since February when he sold his practice to Dr. I. L. Mitby on retiring.

Dr. Kelly was born in Tawas City, Michigan, in 1874. After working his way through the medical school of the University of Michigan and graduating in 1897, Dr. Kelly established an office at West Farmington, Ohio, where he remained for a year. In 1898 he moved to Aitkin, Minnesota, where he practiced until his retirement this year.

The hardships encountered in the early years of his practice, with poor roads, doubtless accounted for the interest he took in road improvement. At the time of his death he was president of the Northwest Good Roads Association and he had been president of the Aitkin and Minnesota Automobile Associations.

At the time of the World War, Dr. Kelly enlisted as a lieutenant in the Medical Corps. He was first put in charge of an infirmary at Hancock, Georgia, and later was surgeon in charge of troops on the *S.S. President Lincoln* on the ship's last trip before it sank. He served as inspector at Camp St. Magaire and was regimental surgeon in the first air service at Les Vasges. Later he was surgeon for the Epinol district and before his return to the United States had achieved the rank of lieutenant colonel. In 1924 he was made colonel of the Reserve Corps. He was a past commander of the Aitkin American Legion Post and a member of the Veterans of Foreign Wars.

Dr. Kelly was one of the first health officers of Aitkin County. He was past president of the Upper Mississippi Valley Medical Society and a member of the Minnesota State and American Medical Associations. He also held membership in the Association of Military Surgeons of the United States.

Dr. Kelly was a charter member of the Aitkin Lions Club. He was also a member of the Minnesota Safety Council and of the Minnesota Law and Order League. He had served as director of the Minnesota State Sanitary Conference. A 32nd Scottish Rite Mason, Dr. Kelly was a pastmaster of the Aitkin lodge No. 213 A.F. and A.M.

While medicine was Dr. Kelly's main interest, his next thoughts were for his community and state, working especially for road improvement. He was a great lover of nature and was very fond of Mesquaghughik, his country place at Cedar Lake near Aitkin.

James Alfred Watson

1867-1939

DR. JAMES ALFRED WATSON was born in Longford, Ireland, on September 5, 1867, and died in Minneapolis, June 17, 1939.

Dr. Watson came to Canada at the age of seventeen with his father. They were followed shortly by his mother and three brothers, and the family settled on a farm at Pilot Mound, in Manitoba. By means of teaching in the elementary schools, he was able to finance his medical education at the University of Manitoba, in Winnipeg, graduating in 1894. He then went to Wood Lake, Minnesota, to engage in the practice of medicine. In 1898 he left Wood Lake to undertake postgraduate study in eye, ear, nose, and throat work in New York and Vienna, returning to Minnesota in 1900. In this year he married Lucia Coghlan of Wood Lake. He then commenced the practice of opthalmology and otolaryngology in Minneapolis, and continued in this actively until June 15, 1939, just two days prior to his death.

During the earlier years of his practice in Minneapolis, he was a member of the faculty of Hamline University Medical School.

Since 1920 he had practiced as a member of the Eye, Ear, Nose, and Throat Clinic, in close association with Drs. Eugene Strout, John Macnie, and W. E. Patterson. Until 1932, the clinic was housed in their own building at 74 South 11th Street, after that time in offices in the Medical Arts Building.

Dr. Watson became a citizen of the United States not long after entering practice in Minneapolis. During the entire period of his life in Minneapolis he was an active member of Hennepin Avenue Methodist Episcopal Church.

He was a member of the following associations and clubs: Hennepin County Medical Society, Minnesota State Medical Association, American Medical Association, American College of Surgeons, American and Minnesota Academies of Opthalmology and Otolaryngology; Minneapolis Athletic Club, Lafayette Club.

Surviving are his wife and four children, Cecil James, Leland Alfred, Elinor Isabel, and James Alfred, Jr., all of Minneapolis.

During the long period of his practice and life in Minneapolis, countless associates, patients, and acquaintances had known him as a sound and conservative practitioner of medicine, and as a true and kindly friend.

OF GENERAL INTEREST

Dr. D. W. Cummings, formerly of Waseca, is now located in Byron, Minn., where he opened offices August 1.

* * *

Dr. Oscar Lipschultz announces the opening of his office for the practice of x-ray diagnosis and therapy at 506 Medical Arts Building, Minneapolis, Minnesota.

* * *

Dr. J. W. Erickson of Minneapolis opened offices for the practice of medicine in Jackson the first of August. Dr. Erickson recently completed a year's interne work at Swedish Hospital.

* * *

Dr. R. W. Campbell and Dr. C. H. Coombs of Cass Lake have combined their respective offices and will maintain headquarters in the recently incorporated Cass Lake General Hospital.

* * *

Dr. J. W. Brooks, for the past year member of the medical staff of the General Hospital, Madison, Wis., has located at Lancaster and has established his residence there. He is associated with Dr. J. J. Stratte and Dr. A. S. Berlin of Hallock.

* * *

Dr. E. N. Nelson has opened a medical office in Lake Park. He comes from Cashton, Wis., and is a graduate of the University of Cincinnati, class of 1938. He interned at the Cincinnati General Hospital and the Swedish Hospital in Minneapolis.

* * *

Dr. Manford B. Dahle, a graduate of Rush Medical College, has opened offices for the practice of medicine at Warroad, Minnesota. Dr. Dahle plans to devote a good share of his time to surgical work, besides carrying on a general practice.

* * *

Dr. Robert W. Merrill, who was associated with the late Dr. J. F. Cumming in the practice of medicine in Morris, has bought the practice and equipment of his late associate. Dr. Merrill graduated from the College of Medicine at the University of Minnesota in 1937. Prior to coming to Morris he spent two years in hospital work in Milwaukee, Wis.

* * *

Dr. David P. Anderson, Jr., of Philadelphia, has become associated with the Austin Clinic and will be in charge of surgery. Dr. Anderson is a graduate of the Medical School of the University of Pennsylvania. The past five years have been spent at the Philadelphia General Hospital, the past three as surgical resident. Dr. and Mrs. Anderson moved to Austin, August 15.

* * *

The report has been received that a young man, about twenty-nine years of age, slender and dark complexioned, about five feet eight inches tall, has been visiting doctors in Hibbing and vicinity in quest of morphine for severe renal colic. The presence of blood and pus in the urine offer some grounds for the dispensing of an opiate, but check of his name and residence proved his statements false. These facts are presented as a warning to physicians.

* * *

The Honorable Harlan J. Bushfield, Governor of South Dakota, has appointed a Basic Science Board as authorized by the 1939 South Dakota Legislature. The members are as follows: J. D. Alway, M.D., Aberdeen, South Dakota; F. E. Burkholder, D.O., Sioux Falls, South Dakota; M. L. Severence, Chiropractor, Aberdeen, South Dakota; Wm. H. Waller, Ph.D., Professor of Anatomy, University of South Dakota, Vermillion, South Dakota; Gregg M. Evans, Professor of Chemistry and Physics, Yankton College, Yankton, South Dakota.

* * *

Members of the Minnesota-Dakota Orthopedic Club will serve again this year as clinicians at the fall field clinics conducted by the Bureau of Services for Crippled Children of the State Social Security Board. The clinic schedule has been announced as follows:

Worthington, September 9; Hibbing, September 16; Marshall, September 23; Winona, September 30; Bemidji, October 7; Fergus Falls, October 28; and Mankato, November 18.

Coöperating with the bureau is the Minnesota Public Health Association, the Division of Rehabilitation of the State Department of Education, and Gillette State Hospital.

A letter of referral from the attending physician of the patient is all that is required for entrance to the clinic. All physically handicapped children under twenty-one years of age whose parents cannot provide the needed care are eligible.

* * *

Effective July 1, 1939 applicants for marriage licenses in New York State are now requested to present certification by a licensed physician, not necessarily in New York State, as to the absence of syphilitic disease as shown by physical examination and serological test. The blood test must be performed by a New York City or State Health Department laboratory. Information concerning approved out-of-state laboratories may be obtained from the New York City Department of Health, Worth and Centre Streets, New York City. Blood specimens may be sent by air mail to the Division of Laboratories and Research, New York State Department of Health, New Scotland Avenue, Albany, New York, where examination will be made free of charge.

Further information relative to the marriage of persons in New York State, exclusive of New York City, may be obtained from the Division of syphilis control, New York Department of Health, Albany, New York.

BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

BOOKS RECEIVED FOR REVIEW

Functional Disorders of the Foot. Their Diagnosis and Treatment. Frank D. Dickson, M.D., F.A.C.S., Orthopedic Surgeon, St. Luke's, Kansas City General and Wheatley Hospitals of Kansas City, Missouri, and Providence Hospital, Kansas City, Kansas; and Rex L. Diveley, A.B., M.D., F.A.C.S., Orthopedic Surgeon, St. Luke's, Kansas City General, Research and Wheatley Hospitals, Kansas City, Missouri, and Providence Hospital, Kansas City, Kansas. 305 pages. Illus. Price, $5.00, cloth. Philadelphia: J. B. Lippincott Co., 1939.

Do You Want to Become a Doctor? Morris Fishbein, M.D. 176 pages. Price, $1.50, cloth. New York: Frederick A. Stokes Co., 1939.

Cardiovascular Diseases. Their Diagnosis and Treatment. David Scherf, M.D., Associate Professor of Clinical Medicine, New York Medical College, and Linn J. Boyd, M.D., F.A.C.P., Professor of Medicine, New York Medical College. 458 pages. Price, $6.25, cloth. St. Louis: C. V. Mosby Co., 1939.

The Infant and Child in Health and Disease. With Special Reference to Nursing Care. Second Edition. John Zahorsky, A.B., M.D., F.A.C.P. Professor of Pediatrics and Director of Department of Pediatrics, St. Louis University School of Medicine, and Pediatrician-in-chief St. Mary's Group of Hospitals, etc.; and Elizabeth Noyes, R.N., Superintendent and Instructor of Pediatrics, Children's Hospital, San Francisco, California. 496 pages. Illus. Price, $3.00, cloth. St. Louis: C. V. Mosby Co., 1939.

Operative Orthopedics. Willis C. Campbell, M.D. 1154 pages. Illus. Price, $12.50, cloth. St. Louis: C. V. Mosby Co., 1939.

Transactions of the Third International Goiter Conference and the American Association for the Study of Goiter. 547 pages. Illus. Price, $6.00, cloth. Portland, Ore.: J. C. Hamilton, 1939.

Epidemic Encephalitis. Etiology, Epidemiology, Treatment. Third Report by the Matheson Commission, Willard C. Rappleye, Chairman. 493 pages. Illus. Price, $3.00, flexible binding. New York: Columbia University Press, 1939.

MANUAL OF THE DISEASES OF THE EYE. Charles H. May, M.D. 16th ed. rev. 515 pages. Illus. Price, $4.00. Baltimore: Wm. Wood & Co., 1939.

This manual, in its fifteenth edition since first published in 1900, is so well known that a review of this last up-to-date publication seems superfluous. It adequately fills the need for which it is intended—a textbook of ophthalmic knowledge for the undergraduate student and the general practitioner of medicine.

C. E. Stanford, M.D.

OTOLARYNGOLOGY IN GENERAL PRACTICE. Lyman G. Richards, M.D. 352 pages. Illus. Price, $6.00. New York: The MacMillan Company, 1939.

The aim of this book, as frankly stated by the author, is to help the general practitioner determine which cases he should refer to the specialist. It is well written and is a safe and honest presentation of the common diseases of the ear, nose, and throat.

Fifty pages are devoted to the discussion of tonsillectomy and adenoidectomy. The conclusion is that the author considers this operation to be in the field of the general practitioner.

Sinus disease is clearly described, although no mention is made of its treatment by means of suction, either direct or by the Proetz method. The use of hot nasal irrigations is advised. The use of silver protein packs is not recommended. A more complete discussion of sinusitis in children would be expected, in view of the author's extensive experience.

Laryngeal diseases as well as those belonging to the field of endoscopy are carefully described.

The book offers nothing new, but nevertheless can be recommended to the general practitioner as a safe and up to date guide in the diagnosis and treatment of the common diseases of the ear, nose, and throat.

Kenneth A. Phelps, M.D.

A TEXTBOOK OF NEURO-RADIOLOGY. Cecil P. G. Wakeley, R.Sc., F.R.C.S., F.R.S.E., F.A.C.S., F.R.A.C.S. (Hon.) Senior Surgeon, King's College Hospital and West End Hospital for Nervous Diseases, et cetera, and Alexander Orley, M.D., D.M. R.E., Fellow of the British Association of Radiologists; Radiologist, West End Hospital for Nervous Diseases, et cetera. 336 pages. 229 illustrations. Price, cloth, $7.25. Baltimore: The Williams and Wilkins Company, 1939.

The authors state that because of the intimate connection between cranial surgery and radiology this work has been undertaken in collaboration between a surgeon and a radiologist. They emphasize the fact that neurology and neuro-surgery have made great advances in recent years and radiology has played its part in this connection. Thanks to the refinement of the radiographic technic and of the radiological interpretation more information can be obtained now from the plain radiograph than was possible a few years ago, while at the same time ventriculography, encephalography and myelography have opened up new fields in the diagnosis of cerebral and spinal lesions and cerebral angiography has proved very valuable for the diagnosis of cerebral pathological conditions, particularly aneurisms. Out of all this has grown a considerable literature, in papers and monographs scattered over a number of countries and this book is an attempt to gather together and correlate all of this, in condensed form, in one volume.

It is an excellent piece of work, giving in compact form a very practical summary of the entire field set forth above. While many of the illustrations are from other sources they have been carefully selected and there are many excellent original diagrams. The book deals well with traumatic lesions of the skull and spine and should have a wide field of usefulness.

Gilbert Cottam.

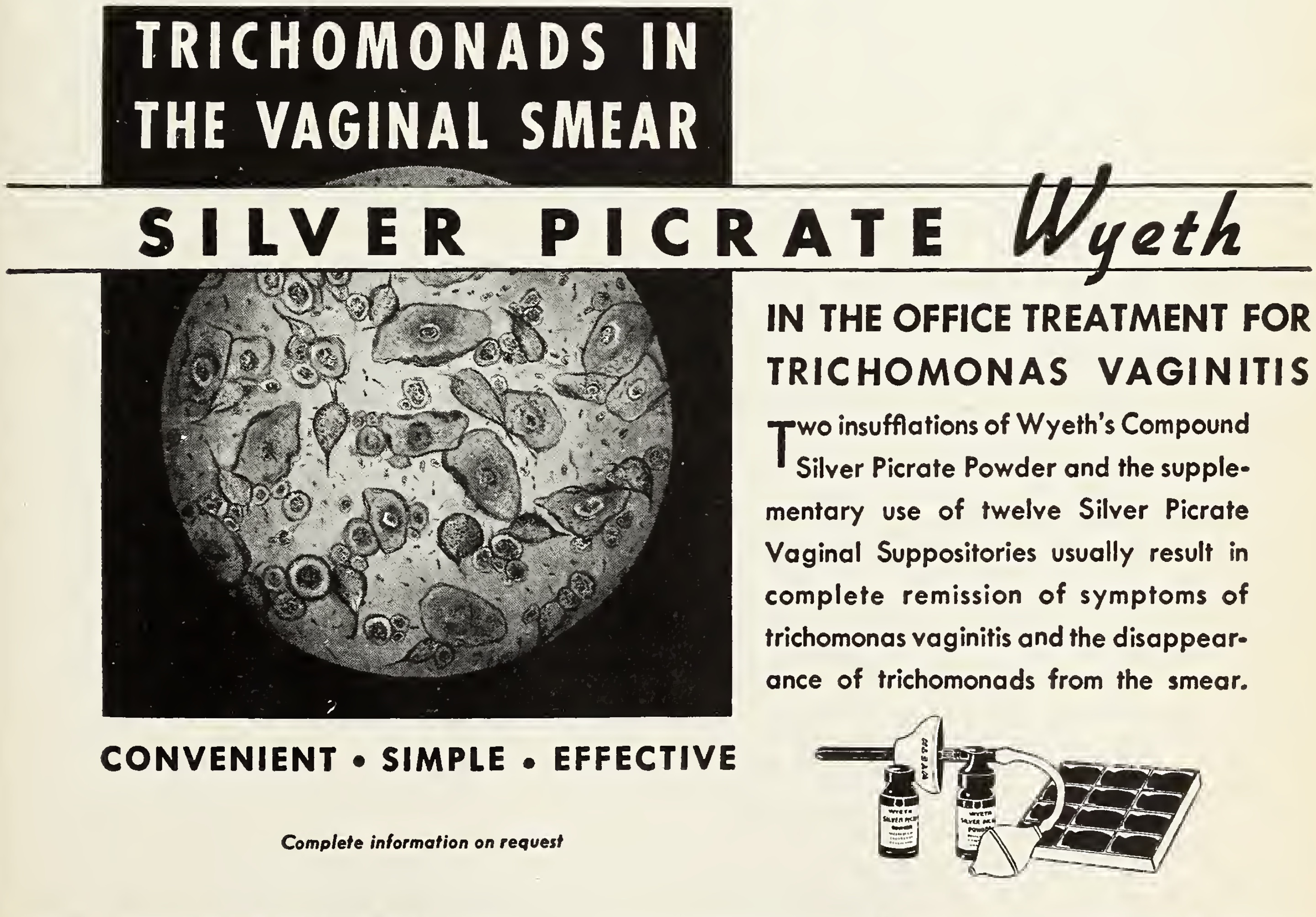
LIFE AND LETTERS OF DR. WILLIAM BEAUMONT. Jesse S. Myer, A.B., M.D. Late Associate in Medicine in Washington University, St. Louis. With an Introduction by Sir William Osler, Bt., M.D., F.R.S. Late Regius Professor of Medicine in Oxford University, England. 327 pages. Illus. Price, $5.00. One-half cloth. St. Louis, The C. V. Mosby Company, 1939.

This is a reprint of the volume published twenty-five years ago, with certain additions upon which we shall comment later in this review.

In securing the material for this book, Dr. Myer had access to a unique mass of source material, which he utilized to the full. It seems that throughout his active years Dr. Beaumont had formed the habit of preserving all cogent scraps of information which came into his possession. Letters, memoranda, documents, manuscripts, diaries, clippings, books, et cetera were carefully preserved and after his death they were assembled in two old chests which ultimately found their way into the possession of Mrs. Sarah Beaumont Keim, his daughter, who lived in St. Louis, where Dr. Beaumont had spent the last thirteen years of his life in general practice and where he died in 1853 and was buried in Bellefontaine Cemetery. Mrs. Keim turned over these chests to Dr. Myer and the contents were also examined by Dr. Osler and commented on in his introduction to the facsimile of Dr. Beaumont's original monograph entitled Experiments and Observations on the Gastric Juice and the Physiology of Digestion which was reproduced by the Harvard University Press in 1929, the original book having appeared in 1833.

With untiring zeal and unlimited patience, Dr. Myer went through this motley collection of nondescript material, sorted it out in chronological order as best he could and set aside the items which he felt would best serve his purpose. The result is a remarkably human portrayal of the man as he was and with Dr. Myer's interpolations and comments a sequence is preserved throughout which makes the book read like a fascinating novel, or better, a living biography. It is regrettable that Dr. Myer, then a youngish internist in his prime, should have died shortly after the production of this work in 1912. At least he left a monument that will tend to perpetuate his memory far better than any bronze tablet or even a heroic statue could have done.

The original edition became exhausted and with the untimely passing of its brilliant author so soon afterwards, nothing further was done about it until this year, when Arno B. Luckhardt, writing in the May issue of the *Bulletin of the History of Medicine,* published by the Johns Hopkins Press, about the Dr. William Beaumont Collection of the University of Chicago, had the following to say: "It is hoped that the various libraries, societies, clubs, and individuals will list similarly their Beaumont memorabilia so that a *complete* list of the known Beaumontiana can be published soon in a truly 'Fultonian' manner. If this is done, some future medical historian, with full knowledge of the location and nature of the new source material, should be able to issue a more comprehensive biography and scientific



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evaluation of Beaumont than has yet appeared. *Or,* (and here the italics are ours) *the material could be incorporated in a new edition of the scholarly volume of Jesse Myer* (Life and Letters of Dr. William Beaumont, C. V. Mosby Company, St. Louis, Mo., 1912, pp. 317), *still the standard work but hardly obtainable,* as a book dealer ascertained lately when he failed to obtain a copy for which he was willing to pay $75.00. *We certainly owe this effort to America's ranking pioneer physician, gastroenterologist, and model scientific investigator, Dr. William Beaumont."*

Regrettably this excellent advice was too late to reach the publishers, for the present reprint was already in the press, if not actually in distribution. It contains intact the original material written by Dr. Myer, with the correction and verification of certain dates by W. Scott Hancock, and the adequate introduction by William Osler. This would have been quite enough, short of an exhaustive undertaking such as Luckhardt proposed, but the publishers did neither. In their anxiety to adorn the lily they have made three additions which leave this reviewer in the same emotional state as if he had seen the Mona Lisa decorated with lipstick or had listened to the Mendelssohn Concerto in E minor with the cadenza furnished by Irving Berlin. First there is a five-and-a-half page "present-day appreciation" by A. C. Ivy which is both tautological and superfluous, written perhaps to sell the book to those of us who are underprivileged in modern physiology. Osler said it all in one-half the space and his words are as timely today as in 1912. His one paragraph about Prout and Pavlow are enough. Then there is a reproduction in colors of Dean Cornwell's lurid depiction of Beaumont in full dress army uniform, gold lace and all, collecting a specimen of gastric juice from the stomach of Alexis St. Martin in a squalid hut such as "that old fistulous Alexis" undoubtedly occupied. Beaumont's army pay at that time was $40.00 per month, with two to four daily rations, but perhaps the picture is allegorical, a term used by artists to cover the most blatant incongruities. Finally, and here the thing gets ridiculous, are reproduced "Four Letters of Alexis St. Martin," who never wrote a line in his life. They were all written for him, of course, as were all his letters previously, which he used to sign by making his mark, but in the case of these four letters, written the year before his death at about the age of 80, he probably felt too weak and feeble to do that much and allowed whoever wrote the letters to sign his name for him. There is not a line in the book to indicate that these letters were not the work of St. Martin himself. On the contrary, the publishers felicitate themselves in their announcement on page XXXI on securing "several hitherto unpublished letters written by Alexis St. Martin. These will be found in the Appendix." Poor old Alexis, illiterate, besotted, temperamental and a sore trial to his benefactor, had only two things in life: his fistula and his ability to perpetuate his kind. He was the father of seventeen children, four of whom were living at the time of his death.

Gilbert Cottam

A TEXTBOOK OF OBSTETRICS, WITH SPECIAL REFERENCE TO NURSING CARE. Charles B. Reed, M.D., F.A.C.S., and Bess J. Cooley, R.N. 476 pages. Illus. Price, $3.00. St. Louis: The C. V. Mosby Co., 1939.

This book is offered as a text for student and graduate nurses. The material is presented in condensed form and covers the field of obstetrics in an orthodox manner. The style is more adapted to the medical student than to the nurse.

In the discussion of Anesthesia in Obstetrics, Sir James Y. Simpson is placed in Glasgow instead of Edinburgh. The illustration on page 329 taken from Titus' "Management of Obstetrical Difficulties" is placed upside down.

The book offers little in style or form to compete with a number of excellent texts already on the market.

Archibald L. McDonald, M.D., F.A.C.S.

CORRESPONDENCE

To the Doctors of Minnesota—A Word of Appreciation

For the past twenty years, eighteen of which have been spent in Minnesota, I have represented the W. F. Prior Company of Hagerstown, Maryland. During this period I have met most of the members of the Minnesota State Medical Association.

It now becomes expedient for me to return to my native Australia for an extended trip, with the probability of remaining there, and I want this brief note to convey to you my deep appreciation for the friendly reception and loyal support and help which you have given me in my business during all these years.

To the several of you who have rendered professional service and friendly counsel I especially tender my sincere thanks.

If any of my many friends and acquaintances among you should ever plan a visit to Sydney I suggest that you write me in advance to 26 Brown Street, Waverley, Sydney, Australia, and while I can't offer you the "keys to the city," I do promise to try to make your stay in Sydney as enjoyable as I possibly can.

My work among you has been pleasant, inspirational and enlightening, as well as profitable materially, and it is with sincere regret that I leave the finest group of people with whom a man could wish to work.

With sincere good wishes for health, happiness and success to all of you, I am

Very sincerely yours,

H. R. (Bill) Lambert,
2554 Garfield Avenue South,
Minneapolis, Minnesota

P. S. We are leaving Minneapolis September 10.

MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

Volume 22 OCTOBER, 1939 No. 10

THE PRINCIPLES OF FRACTURE TREATMENT*

CHARLES L. SCUDDER, M.D.
Formerly Asst. Professor of Surgery, Harvard Medical School
Boston, Massachusetts

DURING the course of years, fundamentals are bound to change; those that I now stress you may alter or even discard, for you will have other ideas. I come, therefore, as a commentator upon what I consider today the fundamentals of fracture treatment. I believe that the treatment of a person with a fracture should begin when the fracture happens, and that treatment should continue until he is able to work.

Social service activity within the profession of medicine is a necessary and potent factor to the success of sound surgery. A fracture is a surgical problem; it is also a social problem. It is surprising to what a large extent the personality of the patient tends to be lost, in the rather complicated surgical service of today. If the patient is given a real chance to explain what he knows about the situation to the doctor, who has skilfully established friendly relations, the result often is a flood of helpful light.

It is no easy job to conduct properly the treatment of a fracture case from its inception until the man is back at work. When we begin the treatment of a fracture, we assume responsibility—certain obligations to the profession of surgery, obligations to the patient and obligations to the community.

The principles of treatment are personal and technical. Familiarity with these personal principles underlying fracture treatment may have obscured their importance. Therefore, I shall review briefly these personal principles.

Imagine a fracture of a long bone in a child. I am called by the distracted parents to take care of this child. Why am I called? The ordinary reason given is that I am regarded as the family doctor. I delivered the mother of this family of all her children. The mother says, "Doctor, you know the constitution of this family." "We have confidence in you." It is true that I have been practicing in this family for a number of years.

The idea that *anybody* can treat a fracture is less prevalent than it used to be.

The imaginary case cited raises the question of the competency of the doctor to treat the fracture. There should arise immediately in the doctor's mind the query, Am I prepared to take care of this fracture? Do I know how to find out exactly what the damage is? Am I competent to decide what is to be done in this particular case, and to do it?

Times are somewhat changed Down East. I imagine there may be difficulties, too, right here in Minnesota. Medical business isn't what it used to be. It is different. In the above imagined situation, the doctor may say to himself, "I need the money. I can take care of this fracture. The family thinks I am able, and that is a great asset. I will make a bluff at it and, if I get stuck, I will call for help." Under the economic conditions today, it may be difficult for even a conscientious doctor to give up such a case, deciding that he is unable to handle it. This story illustrates the first personal principle in the treatment of a fracture. *The physician must decide whether he is competent.*

If the doctor is in doubt, then the second personal principle obtains: *A consultant must be called.* By securing early, immediate advice, you may avoid and prevent a Volkmann's contracture after an injury to the elbow of a child —a member of one of those families who trust your skill in obstetrics and see no reason for your not being able to handle successfully a simple bump on the elbow.

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*Read before the annual meeting of the Minnesota State Medical Association, Minneapolis, Minnesota, May 31, 1939.

In a town not a thousand miles from here, I was holding a fracture clinic. Cases came to the clinic from all round about. In came seven children, each with an established Volkmann's contracture following a supracondylar fracture of the humerus. Splints and bandages were not incidents in these particular cases. It was a sickening sight. In order that the doctors present might all see these small patients, we found seven chairs, placed them in a row, and lifted each child to a chair, where he stood. Seven chairs, seven children: seven cases of Volkmann's contracture—a sorry sight.

These cases pointed a moral then and they do now dramatically accentuating the second personal principle of fracture treatment. If in doubt, consult at an early date with some one who knows better than you do. Each of these seven bad results might have been avoided. Unwarranted responsibility is a risk to the patient and to the reputation of the doctor. If you, as the attending physician, ask for an *early* consultation, you give your patient a better chance, and your consultant a better chance. You yourself rise in the esteem of your patient and in the good will of the community in which you practice.

Therefore, these two fundamental personal principles are important:

a. Decide as to your competency;
b. If in doubt, have an early consultation.

If you habitually treat cases of fracture, become familiar with the technical principles of treatment. I will enumerate them, and comment briefly upon each.

1. The proper transport of the injured. Shock.
2. Recognition of associated injuries.
3. X-ray of parts involved.
4. Bone replacement.
5. Make primary treatment permanent.
6. Secure solid union, perfect function, and ability to return to work.

1. *The Transport of the Injured.* In the past to have received a fracture meant to the lay mind quite uniformly carrying for life an uncertain amount of deformity and some disability.

The world war, the use of x-ray films in court, compensation boards, the results from follow-up clinics, have all awakened the surgeon to securing better results than formerly in cases of fracture. Major injuries may now be prevented from becoming fatalities. A doctor rarely witnesses an accident. Lay people see accidents. The first aid given by the American Red Cross is good care. In the State of Minnesota there are eighty-nine Red Cross chapters. Of these, forty-one have sponsored first aid courses, and forty-three have established Highway Emergency First Aid Stations. There are 125 Highway First Aid Stations in the State of Minnesota.

A doctor should be well posted on matters of transport, as many lay people now are. Doctors in general are not much interested in first aid.

Always transport suspected and actual fractures in fixed traction. Become familiar with Red Cross methods of the transport of fractures. How would you transport a man with suspected fracture of the cervical spine? How would you transport a fracture of the lumbar spine? To do this safely is an art.

The immediate emergency traction fixation of a recent fracture is the greatest single advance in the treatment of fractures in recent years.

If a patient with a broken thigh is brought into the Accident Room of our hospital *without fixed traction,* we must know that it will be applied immediately by a nurse or interne, before the patient is moved further.

2. Unless *profound shock* is present, an *x-ray* should be taken of the suspected or evident fractures. It is necessary to know how many fractures there are, the lines and planes of fractures, the displacements, in order that treatment may be correctly given. We surgeons ought to see and interpret the x-ray films ourselves if we are to be responsible for the treatment of the patient.

3. *Associated injuries* accompanying a fracture may be serious and assume great impor-

tance. Lung and pleural lesions, following rib fracture, ruptured and injured viscera after blows on the abdomen and loins, rupture of the urethra and bladder after pelvic fracture, cerebral damage beneath the fracture of the cranium.

The diagnosis and treatment of a fracture is certainly very special work. All surgeons treating fractures should have a general surgical training.

> "The art of surgery is far in advance of all the sciences upon which its future depends. Until the art and science stand abreast, the progress of surgery will be slow. Some day science will outdo the art and take its legitimate place as the basis of sound treatment. By swift changes in progress, surgery has become safe and still more safe, until it can be asserted that a further increase of safety for the patient can depend only upon an earlier access of the surgeon to him. The chief risk in surgery today comes from delay. Surgery has been made safe for the patient: we must study to make the patient safe for surgery." (Moynihan.)

Chronic duodenal and gastric ulcers were permitted to advance to perforation, peritonitis, and fatal hemorrhages until comparatively recent times. Fractures are now wittingly allowed to go beyond the time at which successful treatment may be instituted. Such delay in the initial treatment of a fracture forever precludes the possibility of preventing disabling deformity. In some of these cases, even death itself might be preferred to the permanent disability with which we all are familiar.

In our attitude toward fractures, we must eradicate certain deeply rooted conceptions of disease. There is no incubation period in a fracture. In the ordinary case of fracture, there are not six days in which to wait for an organism to react. The accident is instantaneous. The fracture is present. The reparative processes begin immediately. Therefore, treatment should begin without delay so that the reparative processes may be facilitated instead of hindered. By treating a fracture instantly, you treat the fracture. By treating a fracture after delay, you treat a fracture plus complications. Early treatment is easy. Delayed treatment is difficult. Delayed treatment is dangerous. Late treatment is lamentable.

The successful treatment of fractures is predicated upon the correctness of one's conception of the four ends to be achieved. These four goals, if you please, may be called the four R's of treatment, namely: (1) The *R*estoration of the individual; (2) The *R*eposition of the fragments; (3) The *R*etention of replaced bones; and (4) The *R*eturn of the injured man to society.

By restoration, I understand the surgeon's mental picture of the entire progress of the case, from its inception to a complete cure. In approaching a case of fracture, the surgeon will, as a matter of course, assemble all available data—everything relevant to the case—as he does in preparation for any other surgical procedure. A perfect host of conditions may impose themselves about a fracture and postulate treatment. To decide upon the initial treatment is often most difficult. When the surgeon has taken account of every adventitious circumstance and correlated all data, he will note the exact lesion as revealed by the x-ray. He will choose a treatment as closely adapted as may be to all the existing conditions. He will look into the future; he will visualize the initiation and the progress of the treatment chosen.

This *imagined restoration* of the patient includes far more than the prognosis. It includes the progress of the patient from the time of the injury through completed treatment. The restoration of the patient is the vision of the reasons underlying the surgeon's choice of a particular method of treatment. This conception of the restoration is the backlog of all treatment; it is the foundation of successful fracture therapy.

The habit of the active utilization of well understood principles is the final possession of wisdom. The really wise surgeon establishes treatment in consonance with his idea of the restoration of the case. Unless the restoration concept is sound, treatment cannot be sound. The treatment selected will be not only correct but the best possible if based on a clear vision of the *restoration* of the case. Concerning reposition, I shall have something to say in a moment.

The *retention* of repositioned fragments must be accomplished in the treatment of all fractures, and is so effected as to permit eventually the greatest possible active movement in involved or adjacent joints.

The return of the patient to society means the progress from job to job; that is, from the job lost to the job secured. The return includes: (a) the rehabilitation of the injured part; (b) the restoration of joints, muscles, tendons, nerves, and circulation; and (c) the recovery of function by the damaged part to the greatest degree possible, as early as possible.

All fractures are treaated by *non-operative or operative methods,* or by combinations of these two. The procedures available in the non-operative treatment are: (1) traction and counter traction; (2) manipulation; (3) pressure and counter pressure; (4) leverage; and (5) rotation.

Traction and counter traction may be applied by: (a) gravity; (b) manual means; (c) skin hold; and (d) block and pulley, with hitch about the ankle and wrist, intermittently; and (e) skeletal attachment.

It is my firm conviction that a chief cause for poor results in the treatment of fractures lies in the failure to recognize certain mechanical forces, and in the inappropriate, imperfect, and inadequate application of the available forces of traction and manipulation. Each of the ways mentioned for securing traction in the use of the non-operative method may be attended by dangerous consequences. To employ correctly non-operative methods of reposition requires training, a natural mechanical sense, skill, devoted interest, and a good conscience.

The general practitioner first treats most fractures. He may properly and safely continue to do this provided he is familiar with simple adequate emergency treatment and is also aware of his own limitations.

The great difference between the non-operative and operative treatment of fractures lies in the procedure of repositioning the fragments.

The restoration, the retention, the return to function, all are common to the two methods. The repositioning of fragments is indirect by one method, and is direct by the other method.

Thirty years ago, at the time of the popularization and exploitation of the operative treatment of fractures, I said in Atlantic City, in opening the discussion of Sir Arbuthnot Lane's paper, "We are not ready for the popularization of the operative fracture treatment in this country. We should advance fracture treatment by developing non-operative methods." Gentlemen, time has proved that that opinion expressed in 1909 was correct.

Today, I believe the situation in this country has changed and is as follows: The operative treatment of fractures has become a firmly established practice. It is based upon necessity, asepsis, and a clearer knowledge of the pathology of repair. It is a safe and sound treatment. It is no longer a method of last resort. It is often the method of primary choice. The results of such operative treatment when safeguarded and carried out by competent men are brilliant.

Today the non-operative treatment of fractures, properly applied by skilled and trained practitioners, gives superb results. The two methods of treatment available, the non-operative and the operative, are developing and being perfected to such an extent that a satisfactory choice of treatment can be made only by the interested, trained and skilled surgeon.

There are, then, two personal principles underlying fracture treatment:

1. The establishment of one's own competency.
2. When in doubt or trouble, early consultation.

The technical principles are:

1. Treatment of shock.
2. Transportation in fixed traction.
3. X-ray information.
4. Recognition of complications.
5. Use of that treatment which, under the conditions, will secure early function.

Gentlemen! As a constructive contribution to surgery, apply all these principles in your treatment of fractures. Such an effort on the part of the members of a State Association working with and through your Fracture Committee, will help those who are injured, and will be an educational example to improve treatment throughout the country. The Minnesota mind when focussed thus on a definite problem should work out a policy toward fracture treatment which will surpass anything of the sort in the United States.

Is there an American way of treating fractures? Let Minnesota show the American way, which regards not alone the fracture of the bone but has a real interest in the injured man, so that, despite his unavoidable handicaps, he is assisted to a profitable occupation.

ADVANCES IN THE KNOWLEDGE AND CONTROL OF CANCER*

LUDVIG HEKTOEN
Executive Director, National Advisory Cancer Council,
National Institute of Health
Washington, D. C.

MEDICAL knowledge is the result of experience, observation, and experiment. Man has had experience with cancer from the first. It is as old as the race. Cancer so forced itself on the attention that its course, at least in its external forms, could not escape notice. At the dawn of the Christian era Celsus, the Roman author, wrote: "Only the beginning of a cancer admits of a cure; but when 'tis once settled and confirmed, 'tis incurable, and the patient must die under a cold sweat."

The Structure and Nature of Cancer

Our knowledge of the structure of cancer goes back one hundred years when Johannes Müller showed that cancer is made up of living cells like those of the tissue from which it springs. That cancer is an abnormal growth of cells governs the modern study of cancer.

The study of the structure, on which is based the final diagnosis in the given case, and the information about the course and the manifestations of cancer in different parts of the body have established that there are many distinct cancers or cancerous diseases. The word cancer includes many forms, which differ in structure, in rapidity of growth, in the formation of secondary growths, in malignancy, in resistance to roentgen ray and radium. Such differences are seen in cancers of the same organ. This is a most important outcome of observations by clinicians and pathologists. It provides a sound and broad basis for research and treatment in cancer. It offers little hope, however, for one grand solution of the cancer problem in the form of a universal cancer cure.

Another result of the microscopic study of human cancer is the failure to find any microbe or other visible form of life that might be the universal cause. So far as is known now, human cancer is not an infectious or contagious process in the sense that these words are used when we speak of measles or tuberculosis. But it would be a mistake to consider our knowledge of cancer in any of its many forms as fixed, complete. Further research may change our ideas on matters that appear well explained.

I have mentioned outstanding results of observation of the course and structure of cancer. Our descriptive knowledge of cancer is elaborate; manifold manifestations and structural forms are recognized; it is not a single disease, but many diseases, all due to the growth of abnormal cells. We come now to another form of cancer research, namely the experimental, which began about 1900.

X-ray, Radium and Radiation in Cancer

Before discussing the experimental work I wish to refer briefly to the discoveries of the x-ray and of radium. The use of radiation in cancer marks an epoch. It is a marvelous advance—an invisible agent causes cancer to disappear or holds it in check. Unexpectedly, research in physical sciences produced results of the greatest practical value in medicine, with a flood of new problems. How does radiation produce its effect? Why are not all cancers at all times susceptible to radiation? Can insusceptible cancers be made susceptible? And how can radiation be used to best advantage? Great benefits have and will come to the cancer patient from research. Think of the general advances in medicine and surgery, which cannot be discussed now; in diagnosis, as illustrated, to mention only one example, by the revelations of the x-ray; and in statistics which tell us of the extent of cancer and the trends of its course. Just at this time the results of experiments with new methods of radiation and with neutrons and artificial radioactive substances are awaited hopefully.

Experimental Research

The study of cancer by experimental methods begins with the discovery of transplantable cancers in animals. Man has no monopoly on cancer. Perhaps no species is exempt. Even insects have cancer. It was hailed as a great advance when it was found that within the same species cancer can be transplanted by grafts of cancer cells. Please note that as a rule the cells in the host do not become cancerous by contact with the implanted cancer cells. It is the transplanted cells that grow and form cancers in the new host. The structure of the original cancer is retained on successive transplantations.

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*The Annual George Chase Christian Lecture of the Cancer Institute, University of Minnesota, April 17, 1939.

By means of transplantation the influence of various agents on cancer and the reactions and resistance of the body to cancer can be investigated. The great result of this work is that cancer cells retain their power of proliferation indefinitely on transplantation from animal to animal, that is, the secret of cancer is in its cells. And cancer cells, like other cells, can be grown outside the body and thus studied in various ways.

Another result of the study of cancer in animals, particularly mice, is the demonstration that heredity plays a part in cancer. There are cancer-susceptible and cancer-resistant strains of mice. Such strains are now used extensively in work on cancer problems. It is susceptibility to the development of cancer that is inheritable rather than the disease itself. Scientists agree that hereditary properties of cells determine their reactions to environmental influences. I shall not attempt to discuss heredity in human cancer. The general trend favors the view that the degree of susceptibility or predisposition to cancer is determined by heredity. Instances are recorded of the occurrences of the same kind of cancer, in the same organ, at the same age, in descendants of the same parent. Cancer in human twins reveals striking evidences of genetic influences. In a number of cases cancer has developed in twins at the same time, in the same organ, and of the same type. In instances of a hereditary liability to cancer in a particular organ timely examinations may lead to a favorably early diagnosis.

Can cancer be produced experimentally? The answer is yes. In 1916 two Japanese pathologists, Yamagiwa and Ichikawa, produced cancer in the skin of rabbits by long painting with tar. This result opened a new chapter in research; there is now an extensive literature on experimental cancer and cancer-producing substances, a number of which have been made artificially. Some of these substances resemble substances normally present in the body, notably certain hormones which play a part in important cancers. The body itself can produce potential cancer agents.

The fact that pure substances can cause cells to become cancerous brings us face to face with the problem of cell growth in relation to cancer. Here are some of the questions that press for answer: Why do normal cells grow in an orderly fashion? Why is normal growth checked at a certain time and while the power of growth remains latent? Now—why are the cancer cells different? Is there in cancer a breakdown in the growth control of the cell? We have learned to produce cancer in animals. With pure chemicals we can make normal cells cancerous, but this change, in spontaneous as well as experimental cancer, is irreversible—we do not yet know how to unmake it—and for the present the hope in established cancer rests on early diagnosis and expert treatment.

Prevention of Cancer

At this point I must mention that there are cancers concerning the external cause of which there is no doubt. One is chimney sweep's cancer of the skin, recognized in 1775 as due to soot. Here are other examples: cancer of the skin in cotton spinners, due to mineral oil, and in tar workers; cancer of the lip in fishermen repairing tarred nets; cancer of the bladder in workers with aniline dyes; cancer of the lung in certain miners; cancer in the bones of workers with luminous paints; x-ray cancer of the skin; cancer of the skin from taking of arsenic for long periods. These and others as well are preventable cancers; most are connected with definite occupations. In other cancers the causative condition seems obvious but the precise agent is not known. I have in mind cancers of the skin, mouth, tongue, breast, respiratory tract, and other parts arising on the basis of chronic irritations and inflammations. It seems as if chronic inflammation may lead to the formation or localization of cancer-producing substances. It is undoubtedly true that cancer can be avoided by the prevention and elimination of chronic inflammatory states, and consequently that hygiene of the body in the broadest sense will protect against cancer. It has been said that cancer does not arise in a healthy mouth.

While the knowledge of cancer, its diagnosis, its treatment, curative and palliative, have advanced immeasurably, the aphorism of Celsus still holds a great truth. It contains the most important generalization ever made about cancer. It is the basis of cancer education these days, and of all our efforts to control cancer. It stated so clearly the only hope to master cancer because its natural course was known to be fatal. And the course has not changed. A good modern version of the aphorism would be: "The heart of the cancer problem in the present state of knowledge is early diagnosis followed at once by expert treatment." And then comes the question, how is such service to be made available to all classes of people?

Cancer a Public Health Problem

About twenty-five years ago a movement of widening scope set in to educate people to an effective understanding of the necessity of early diagnosis and prompt expert treatment of cancer. Today the treatment of cancer demands organized services and special equipment. Because of its frequency and because so many patients are unable to meet the costs of diagnosis and treatment, cancer is a major public health problem. We are in the midst of a determined effort to advance the control of cancer. Several states have enactments against cancer and the ground is well prepared for such legislation. About two years ago the anti-cancer movement resulted in the passage by the Congress of the National Cancer Institute Act on which I shall offer some comments.

The National Cancer Institute Act

"With a view to the development and prompt use of the most effective methods of prevention, diagnosis and treatment of cancer there is hereby established in the Public Health Service a division which shall be known as the National Cancer Institute." In every provision of the act the purpose is to further the study of the causes of cancer and the application of knowledge, old and new, to the prevention, diagnosis, and treatment of cancer. In other words, the act provides for research as well as for the advancement of clinical cancer service.

At this point a brief explanation of the National Advisory Cancer Council is in order: The purpose of this Council, which is an appointed body of six members with the Surgeon General as chairman, is to make recommendations with respect to carrying out the provisions of the act. Specifically, the Council is authorized to make recommendations in regard to research projects; to spread information about cancer studies, "for the benefit of health agencies and organizations, physicians or any other scientists, and for the information of the general public"; and "to review applications from any university, hospital, laboratory, or other institution, whether public or private, or from individuals, for grants-in-aid for research projects relating to cancer, and certify approval of projects deemed worthy of support."

The act provides $750,000 for the building and equipment of the National Cancer Institute. This building will be ready for use in the latter half of 1939. It is located at Bethesda, Maryland, on ground donated by Mrs. Luke I. Wilson and adjacent to the new buildings of the National Institute of Health. For the year ending June 30, 1938, the appropriation for the Institute was $400,000, of which one-half was for radium. For the present fiscal year (1938-1939) $400,000 has been appropriated to carry out the act, without any specific allotments.

On the basis of this statement of the provisions of the act, I now mention briefly certain steps taken to carry them into effect.

As stated, the sum of $200,000 was available for radium during the past fiscal year. The act authorizes that radium may be loaned to institutions in the United States for the treatment of cancer. Arrangements for loans are now under way, in coöperation with state health departments.

The framers of the act were impressed with the needs for special cancer training because facilities may be provided for that purpose, with stipends for trainees. The existing facilities for systematic postgraduate training in clinical cancer work are limited but can be increased without much difficulty. There are now some twenty trainees at work and facilities are growing for systematic postgraduate training in the diagnosis and treatment of cancer. A graduate of an approved medical school, who has completed the required hospital services and who is not over forty years of age, may be eligible for appointment provided he intends to devote himself to cancer work and can furnish reasonable assurances that opportunities for such work will be available when he finishes his training. Only in exceptional cases will training be provided for a period of less than a year; in most cases at least two to three years are desirable.

The act authorizes also research fellowships "with such stipends or allowances" as may be deemed "necessary to procure the assistance of the most brilliant and promising fellows from the United States or abroad." Fellowships are highly important in developing first-rate investigators, the great need in cancer research. A number of fellows have been appointed for work on various phases of experimental and human cancer—biochemistry, carcinogenesis, genetics, lung cancer, pathology.

When the Cancer Act went into effect the cancer research in progress under the auspices of the Public Health Service was transferred to the National Cancer Institute, of which Dr. Carl Voegtlin is the chief. The National Advisory Cancer Council has approved this program and also projects dealing with pulmonary cancer, cancer statistics and incidence as well as the results of treatment. A survey of the cancer incidence in certain localities has been carried out with the whole-hearted coöperation of the local medical groups. Without such coöperation it would not be possible to conduct successful surveys. Results of this survey are not yet available. The Council is charged with passing upon applications for grants-in-aid for research relating to cancer. So far the Council has considered 102 applications, nineteen of which have been approved for $125,002.50 all told. A large project to engage consideration is the establishment of a cancer unit in the Marine Hospital at Baltimore. The regular beneficiaries of the Public Health Service east of the Mississippi River, the medical care of which falls upon the Service, number approximately 170,000. Of these some 40,000 are in the cancer age and some 4,000 cases of cancer will require treatment in the course of the coming years. The Council approved in principle plans for a complete cancer unit, now in the course of organization, with clinical, research and teaching functions.

The Cancer Act directs that there shall be "coöperation with State health agencies in the prevention, control, and eradication of cancer," and steps have been taken to carry that provision into effect.

State Anticancer Activities

So far New York, Massachusetts, New Hampshire, Georgia and Missouri have recognized cancer as a state health problem by the enactment of laws for its control, New York and Massachusetts being the pioneers. And a few weeks ago Vermont enacted an anticancer law.

In 1926 Massachusetts enacted such a law. The department of public health is directed to establish necessary hospitals, to organize group consultation clinics in the most advantageous parts of the state, to carry on public education in regard to cancer, and to make studies of the cancer situation in the state. At present special stress is placed on the value of talks about cancer in small groups with physicians. There are in operation two state hospitals, a free tumor diagnostic service, and twenty-two state-aided clinics. These clinics are administered by local medical committees. This program is in its twelfth year. The records show that the registered death rate from cancer now appears to be stationary in Massachusetts; that in women the death rate has dropped. It looks as if this state will have the distinction of being the first to show by a decrease in cancer deaths that the disease is "in the process of effective control." It is noteworthy that in Massachusetts the average time between the first recognizable symptoms suggesting cancer and the first visit to the physician has fallen to five months in place of as formerly six to six and a half months. Now, a delay of five months is much too long, and so it is encouraging that the number of patients who go to their physicians within the first month of suspicious symptoms is increasing. From other sources we learn that patients with breast cancer are coming for treatment a few weeks earlier than formerly—another sign that education is having effect. It is recorded of a certain hospital that in 1920 54 per cent of the cases of breast cancer came too late for operation and that in 1937 only 13 per cent came too late. And in Massachusetts physicians are bringing their patients to the clinics more promptly than at first. It is encouraging also that relatively smaller cancers are presented for treatment now than twenty-five years ago.

It is said that the fate of the cancer patient depends largely on the first visit to his physician. Has the physician adopted a wise and practical plan for action in all cases in which the question of cancer may arise? Are his regular patients likely to report to him promptly any suggestive sign? If not, why not? Is the physician fully prepared to take without delay the necessary steps to secure final diagnosis in a doubtful case, either by himself or through competent consultants? Does he realize that it may be a fatal error to tell a patient with a lump or other suspicious sign "to forget it and come back next month"? Are the consultants to whom he may refer cases for diagnosis and treatment fully equipped for prompt, expert service? Does he accept in its full significance the dictum that the treatment of cancer, surgical or radiologic, should be entrusted to those only who have the needed skill and experience? According to the *Journal of the American Medical Association* these are questions the physician must answer satisfactorily if he is to meet his responsibility with respect to cancer as now demanded.

In 1931 New Hampshire recognized cancer as a state problem, and set up a cancer commission to establish clinics, make surveys, expend money for the care of poor cancer patients, etc. Thirteen free diagnostic clinics and three complete treatment centers have been established.

In Connecticut in 1935 coöperation was organized between the tumor committee of the state medical society and the division of cancer research of the state department of health. A subcommittee "is responsible for the establishment of tumor clinics in general hospitals at various strategic points throughout the state." There is in process of organization a series of lay cancer committees, one for each community of the state, "to teach the public that early cancer is curable in a large percentage of cases, and to convince them of the need for prompt action when the disease is suspected."

Missouri in 1937 established a state cancer commission to construct and conduct the Missouri State Cancer Hospital and to organize cancer clinics in the large cities of the state. Each clinic is to be administered by a committee of the county medical society.

Under the recent Georgia law (1937) the state board of health is charged with the establishment of a standard for cancer units and departments in general hospitals in the state, with educational campaigns for cancer control, with providing plans for the diagnosis and treatment of cancer patients who are unable to meet the costs and with acquiring such other facilities as may be necessary to carry out the purposes of the law. The aim is to provide competent cancer service within fifty miles of every resident of Georgia.

New York state has concerned itself with cancer since 1898 when the legislature at the instance of Dr. Roswell Park provided a laboratory, the first of its kind, for the study of cancer—now the famous State Institute for the Study of Malignant Disease at Buffalo. The developments at this institute illustrate well the influence of the growing recognition of cancer as a practical state problem. In 1910 a free diagnostic service was started. In 1912, forty-one physicians from ten communities submitted seventy-six specimens, but the numbers have grown to thousands of specimens each year and in the meantime a great center for the free treatment has been maintained, with active divisions for research and education. Obviously a single institute of this kind can not meet more than a small part of the cancer needs of the state and the New York State Legislative Cancer Survey Commission was created "to make a study of the prevalence of cancer and facilities for its treatment in the State." A report of this commission has been published and I shall review parts of it briefly because of their bearing on state cancer programs.

At present about 20,000 deaths occur annually in New York state from cancer or 144 deaths per 100,000 population. One person of every eight past forty-five years of age may be expected to die from cancer. Whenever a patient in the cancer age steps into a physician's office, the physician must think of cancer.

The State Institute at Buffalo is active in the educational field, and coöperates with the Women's Field Army of the American Society for the Control of Cancer. It is only recently that the state medical society has appointed a cancer committee. Postgraduate instruction in cancer by medical schools has not been stressed. The only institutions in the state to offer training in cancer are the Memorial Hospital in New York city and the State Institute at Buffalo, and here I would note that until recently this statement was applicable to the country as a whole. As elsewhere, free or part-free cancer patients constitute a heavy burden to voluntary hospitals, and the question arises of subsidies for the care of cancer patients.

Outside New York city eighty-one laboratories have been approved for tumor diagnosis by the state department of health, but the distribution of the laboratories is uneven. Facilities for the microscopic diagnosis of tumors are generally lacking in hospitals of less than 100 beds. Competent microscopic diagnosis is essential in cancer and, let me add, more and more so as the patients come earlier when it is difficult to determine the true situation and also because in many cases the kind of treatment is determined by the microscopic nature of the growth. Roentgen diagnosis is provided in 80 per cent of all the hospitals, but again as elsewhere the distribution of qualified roentgenologists is uneven; it is estimated that in New York twenty-five new roentgen installations are necessary to meet the needs of cancer.

In all there are in New York state forty-nine tumor clinics, thirty-five of which are approved by the American College of Surgeons. As pointed out by the College itself approval means a formal organization for effective cancer service and not that effective service cannot be obtained outside of approved clinics.

In New York the geographic distribution of treatment centers is faulty and the report estimates that twenty new clinics are needed. The follow-up of cancer patients is not carried out systematically because of lack of funds. As unfortunately the case in other states the terminal care of indigent patients is "wholly inadequate" and organized home nursing and medical care for the terminal, indigent cancer patient do not exist.

These details have been mentioned to illustrate the many complex factors that must be considered in order to plan intelligently for an adequate state cancer program, with due consideration of the interplay of public, medical, and social agencies. The report will be a helpful guide for other states in dealing constructively with the cancer problem.

On the basis of the survey, the commission recommends that for the present the guiding principle of cancer control in New York state should be away from centralization in new institutes and "toward the development of improved care for cancer patients through the utilization and extension of already existing local hospital facilities," and that the cancer division of the state department of health be reorganized, for "the control of cancer as a public health problem affecting the entire state."

The proposed functions of the division as reorganized may be restated as follows: To take active part in the provision and maintenance of adequate facilities for the diagnosis and treatment of cancer in the various communities according to the principle of decentralization stated a moment ago; to promote the reporting of cancer cases under a proposed amendment to the public health laws; to establish a system of thorough follow-up of all cancer patients subject to state-aided diagnosis or treatment; to aid in the provision of facilities for tissue diagnosis; to carry out useful studies of the statistics and epidemiology of cancer; to take steps to reduce occupational and preventable forms of cancer; and to distribute useful information to physicians and to the public.

These recommendations are in accord with the general principles of the movement toward cancer control illustrated in the state cancer laws, to which I have referred, as well as of the resolutions of the thirty-sixth annual Conference of State and Territorial Health Officers (April, 1938) to the effect that each state and territorial health department endeavor to secure the passage of a state law, establishing within the department of health a division of cancer control, the functions of which should include education, free microscopic diagnosis of suspected tissues, and adequate treatment centers. The resolution is based on the consideration that cancer is a major public health problem, that it is entirely possible to reduce greatly its mortality and the distress incident to its advance by the application of available knowledge, and that the time has come for the public health agencies of the country to take concerted action.

Recapitulation

The idea that cancer is a single disease of uniform cause and subject to one cure has been abandoned. Each kind of cancer results from a new race of cells of invasive, malignant qualities. In the development of cancer cells hereditary influences play an important part. Chemical substances have been discovered that can cause cells to become cancerous, just how we cannot now tell any more than we can explain the secrets of cell growth or cell life. But research will continue. While no ultimate explanation of cancer can be offered today, we do know that many cancers have definite causal relationships and that that knowledge can be used to prevent cancer.

Cancer is a menace common to all of us. The individual must do all he can under the aid of medical advice to escape chronic inflammatory and irritative conditions; he must not forget that "only the beginning of a cancer admits of a cure," and that as the rule the first step toward diagnosis will depend on the patient.

The lack of early action in cancer calls for continued education of the public and the physician. There is grievous lack, too, of competent, accessible service. Enormous difficulties exist as shown by the amount of accessible cancer that slips through into the incurable stage with its crushing burdens of distress. The essentials of cancer service must be brought closer and closer to the patient, actual or prospective. Here are needs that can not be met without the coöperation of public and private agencies. How, for instance, can effective examinations, which are urged in order to detect precancerous processes and cancer in the curable stage, be secured for all classes of people without organized provisions? Besides what can be done by the patient himself, by the medical profession, and by private agencies, public means and methods are required to give to all the full benefits of modern treatment of cancer, with continuous medical and social follow-up. The care of a large proportion of the patients inevitably falls on the community, and the earlier competent care is provided in each case the better for all concerned, including the community itself as a whole.

KEEPING AMERICA HEALTHY*

E. R. COFFEY, M.D.
Surgeon, United States Public Health Service
Washington, D. C.

KEEPING America Healthy is the title assigned to me, and though it has a laudable ring, I am going to take a slight exception to it on the ground that it does not quite portray the public health point of view. It implies that America *is* healthy. It suggests that ours is a static purpose.

The public health job on the contrary is a dynamic one—that of *making* and then keeping America healthy—and one of such proportions and complications that none of us will likely live to rest on our laurels and sigh that there are no more public health worlds to conquer.

It does happen, however, that the subject of an expanded and intensified effort toward a more healthy population provokes in some quarters a veritable litany of the lowered death rates in this country over the past few decades. Nor is it a litany merely of sounding phrases. It chants the truth.

Our death rates have dropped, as you all well know, some of them in precipitous fashion. The curve of diphtheria mortality since the 1890's is one of the many triumphs of public health. Typhoid, once the "backbone" of a practicing physician's income, now scarcely puts in an appearance. The retreat of tuberculosis might well make us proud of man's stubborn progress against his invisible enemies.

Many of us—men of medicine as well as the laity—are prone to relax in comfortable contemplation of these decreased death rates. There are people who in defense of the public health status quo will point to these lower rates as evidence of a job well under control. No able health officer, however, will be found marking time because the diphtheria rate has plummeted from that of a major cause of death to one of relatively minor significance. The able health officer derives little satisfaction from the knowledge that death rates in the United States are lower than those in many other civilized countries. He is not satisfied because he well knows that those same rates could be substantially lowered *now*.

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*Part of Conference on Medical Problems at annual meeting of the Minnesota State Medical Association, Minneapolis, Minnesota, June 2, 1939.

A health officer worthy of his responsibility for the community realizes that general death rates are not the only witnesses in the public health scene. Their story is an incomplete one. They obscure important details that we must have at heart if we are to advance the health and the happiness of the nation. They do not show the course of mortality in terms of economic status, or geographic area, or age groups, or sex, or occupation. They do not reveal that heart disease is a third cause of death among the nation's youth, nor that pneumonia kills three and one-half times more unskilled workers than professional, nor that the deaths of infants on their first day of life, or in the first month, occur with much the same tragic proportion as they did twenty-two years ago.

Death rates do not tell the story of the nation's state of health. They do not show the dependency caused by disease, nor the suffering and economic loss resulting from neglected illness, nor do they reveal the grim saga of those who go to work when they should be in bed under a doctor's care. They do not picture those who are going about their business in our communities and meanwhile spreading contagion. They do not indicate the illnesses that might have been prevented, nor the conditions about which something still could be done.

As to the value of health, that surely needs no elucidation—neither before this gathering nor any other. Even the most confirmed pessimist who preaches the gospel that "the less we expect from life the better off we are," even he extols good health. Without health, nothing else, whatever it may be, is enjoyable; even the other personal blessings—a great mind, a happy temperament—are degraded and dwarfed for want of it.

My premise is that America must first be made healthy. Once we have accomplished this objective, we may talk about keeping America healthy. It is possible that there may be disagreement on the actual means of accomplishing these two great objectives, but certainly not enough to ruin the cause. The underlying principle, after all, so greatly overshadows everything else that it is incomprehensible that we men of medicine, on whose shoulders the burden of this accomplishment falls, should quibble long over the details of procedure.

Sound discussion, rather, should animate our conferences, and on this premise I want to use my privilege of addressing you today to interpret the National Health Program as an answer to the query of how we shall make America healthy and how keep it healthy.

Over the course of the year, public health activities have been gradually emerging from the obscurity of scattered effort into the national significance that they deserve. It was not until the Social Security Act was passed in 1935, however, that the federal government accepted responsibility for aiding the States through substantial financial contributions. This Act may be nominated as a milestone in the public health movement, for it apparently marks the beginning of a permanent program for the expansion of State and local health services throughout the country.

Following the passage of this Act, the President appointed an Interdepartmental Committee to Coördinate Federal Health and Welfare Activities. Its business was to facilitate bringing the full benefits of the varied Federal program swiftly and effectively to the individual citizens for whose aid and service the program had been brought into existence. This Committee appointed a Technical Committee on Medical Care to survey the nation's health and to make recommendations for meeting existing deficiencies in our health services through Federal-State coöperation.

Out of the Technical Committee's activities there developed a National Health Program which was considered at a National Health Conference of professional and civic leaders in Washington last summer. The report of the committees was submitted to President Roosevelt and in turn forwarded by him to the Congress in January. This sequence of events indicates readily the national significance of our common health problems and the desire of the people for a speedy solution of them. Legislation is now being considered by a congressional committee. This proposed legislation, known as the National Health Security Bill of 1939, is another indication of nation-wide interest in health. The bill may not be perfect. It may not be precisely "what the doctor ordered." It may or may not obtain favorable action by the Congress, but at any rate a significant attempt is being made to bring about what must inevitably come—united and national effort to meet the health needs of America. We cannot in all conscience turn away from the facts placed before us by a long series of studies—facts which formed the basis of the Technical Committee's several recommendations. We cannot turn away from an objective consideration of the inroads which preventable diseases and death are making on the population; from the well-known relationship of sickness and poverty, the receipt of medical care in relation to income, the availability of hospital beds in underprivileged communities as against their availability in privileged communities.

The Technical Committee summarized the deficiency of our present health services in four broad categories.

1. Insufficiency of preventive health services for the nation as a whole.

2. The inadequacy of hospital and other physical facilities for good medical care in many communities, especially in rural areas. The insufficient and precarious financial support of existing hospitals in many communities.

3. The inadequacy of our programs, or lack of programs, for medical care of that large sector of our population composed of the indigent, those receiving some form of public assistance and those in the lowest income groups.

4. The inability of an even larger fraction of the population to meet unaided the economic burdens created by illness, in particular the so-called "catastrophic" illness.

An immense amount of data, painstakingly gathered, amply supports these statements. What is even more significant is that these unmet needs are generally recognized by both professional and lay groups throughout the country.

To meet these deficiencies, the Technical Committee developed and recommended a "five-point" national program, in which the efforts of federal, State and local governments might be coordinated. Briefly, the program recommended:

1. Expansion of the general public health services, including maternal and child health; and a concerted attack on specific diseases and conditions of public health importance.

2. Expansion of hospital facilities *where needed.*

3. Provision of medical care for the medically needy.

4. Development of general programs of medical care.

5. Insurance against loss of wages during sickness.

How would these proposals be implemented? How would the program "work"? Let us consider those phases of the program relating to public health, hospital and medical services and facilities. The expansion or provision of these programs would be implemented by federal grants-in-aid to the States. The federal function of providing financial and technical aid to the States is thoroughly familiar to legislative and administrative bodies throughout the country. This is the rôle assigned to the federal government in every phase of every proposal of the national health program. I wish to make this point emphatic in view of the widely expressed opinion that the National Health Program in some way means federal domination. The responsibility of developing and administering each phase of the program rests with the States and local communities. The autonomy of State and local governments is clearly recognized and stated. The National Health Program does not recommend that the federal government go into any State or any community and "set up" a health program, build a hospital, or engage in the practice of medicine.

The development of health services and medical care programs in the United States has been intensely local. I think I may say that no one recognizes this phenomenon more realistically than those officials of the Federal government engaged in the administration of Federal funds for public health work. Because of this factor, the Technical Committee realized that no one program is, or probably can ever be, universally applicable to the varied health problems of forty-eight States. Therefore, the fundamental objective of the National Health Program is, through federal grants-in-aid and technical assistance, to enable the States to put into action sound plans for making modern public health services and medical care available to all their citizens.

Without the active participation of professional and voluntary agencies in the States and communities, the objectives of the National Health Program could not possibly be realized. This self-evident fact was specifically recognized by the Technical Committee, and the participation of the professions and voluntary agencies was invited. In a number of discussions with professional groups, subsequent to the National Health Conference of July, 1938, the question has frequently been raised as to the status of the voluntary hospital under the National Health Program. Let me reiterate the statement that there is no proposal in the National Health Program "to do away" with the voluntary hospital. Under Recommendation I (public health, maternal and child health) and Recommendation III (medical care of the medically needy), provision is made for the hospital care of certain categories of patients. This would be accomplished through a greater use of existing hospital facilities in State and local communities. Costs of hospital care for patients under the specified categories would be met by combined federal, State and local funds. In no case would hospital construction be undertaken unless a clear need were established.

I think it should here be stated frankly that the responsibility for setting and maintaining standards of administration, personnel and services in the local program is again vested in State and local governments. This will require professional and civic leadership of a high order. In the National Health Program, State and local money, as well as federal money, would be at stake. I have yet to hear any one deny the right of government to demand adherence to certain standards in the expenditure and administration of funds. Likewise, it was the Technical Committee's opinion that it will be necessary for the federal government to set minimum standards in order that federal funds may be administered with reasonable efficiency and economy. This principle has worked effectively in the administration of Social Security funds for public health, maternal and child health, and for the crippled children's program, without any complaints of federal domination. I see no reason to assume that it would not also work in connection with Federal-State coöperative programs looking toward the provision of hospital and medical services.

What will such a program cost? The estimates of the Technical Committee have been subject to a good deal of amateur analysis. It has been reported in the press and elsewhere that Recommendations I, II, and III (public health, maternal and child welfare, hospital facilities and medical care of the needy) would cost eight and a half billions. This is a gross misconception. It is apparently based on the assumption that the total maximum estimated cost of these three phases of the program would have to be met *each year* for ten years. The Technical Committee, however, conceived of the program as a gradually expanding effort, beginning with relatively small additional expenditures, and stepping up over a period of ten years to a total maximum expenditure of 850 millions—from all sources, federal, State, and local. It was also estimated that the maximum federal contribution to the program at its peak of operation would be about one-half of this sum, or 450 millions. It was estimated that these sums would be required when the expanding program, providing adequate health services, hospital facilities, and medical care for the needy, should have reached its maximum peak.

This is only an estimate, framed on the national basis, and it is all that we can reasonably offer until we try for a while to provide adequate health services. As long ago as 1925, Dr. Haven Emerson was making this very point, and I can assure you that the picture has not significantly changed since that time. In fact, the hardships of the depression have served to intensify our needs for national, permanent efforts toward better health. At the National Conference of Social Work in 1925, Dr. Emerson said:

"Since adequate health services have nowhere yet been provided, no one can tell what they really will cost. We have, however, fairly reliable means of recording and estimating the cost of the neglect to invest in health. It may be fairly stated that it costs any individual or group not less than four times as much to go without health protection and adequate services as to pay for it. . . . We shall never know what adequate health service costs until we try to give it. At present, we are giving hardly more than half of what science and the labors of past generations have put into our hands, as trustees, to be used."

What the National Health Program is suggesting is that we all join together—all the professions, and all the people—and accept that challenge laid down nearly fifteen years ago, and that we accept it and meet it *now.* We have learned with increasing faith and with increasing confidence during these years that it can be done. Our skills are surer, our procedures more refined, more generally applicable. It remains only for those of us in the professions to turn a calm and dispassionate eye upon the national health problem—and then to translate that dispassionate view into a passionate desire to meet the health needs of the people. Then, and only then, can we plan for the future—a future in which our principal effort may be, we hope, "keeping America healthy."

MEDICAL CARE AND ITS DISTRIBUTION IN CANADA*

F. W. JACKSON, M.D., D.P.H.
Deputy Minister of Health and Public Welfare of Manitoba
Winnipeg, Manitoba, Canada

NO MATTER how much we like to think of democracy as the state composed of individuals, I am sure we will all agree that under the present set-up in our social system the security of the individual is becoming of paramount importance to the state. Such being so, it is only natural to find that in our democracy the state is now taking an ever increasing part in the provision of those things for the individual which will make his life a happier one.

We find that the state now provides free treatment for tuberculosis, for mental conditions and for venereal disease. The state provides, in various ways, medical treatment for the unemployed or for other persons unable to pay. The state, through local governing bodies, makes provision for hospital expenses for individuals who cannot pay out of their own resources. Besides all this the state also has set up a Health Department for the prevention of disease and preservation of health, which includes inspection of water and food supplies, supervision over the production of milk, the provision of public health nurses, travelling clinics and in some cases dental treatment; but after all this is done the fact remains that many people are in a sad plight when illness strikes. Actually, a severe illness is a family and community catastrophe of major importance. In order to try and prevent such an undesirable situation many organizations in Western Canada have gone on record as favoring some form of "state medicine" or "health insurance." Other organizations have appointed committees to make a study of state medicine and all its implications, and in some of the provinces legislation has been placed on the statute books providing for the inauguration of schemes of state medicine or health insurance. The humanitarianism behind such plans constitutes a powerful appeal to the imagination, and this is one of the factors which sways large groups to make an insistent demand for social reform of this character.

This demand is not a new thing in Canada, particularly in the Western Provinces, where for the last twenty years isolated communities have been experimenting in various types of state medical care.

The first active movement taken towards the adoption of health insurance in Canada was by the Province of British Columbia, which in 1920 appointed a Royal Commission to investigate the subject. This Commission recommended the adoption of a system of health insurance and outlined a plan. However, nothing was done at that time. Again in 1929, another Royal Commission on the same subject was appointed and they made two reports, the final one in 1932. As a result of this report a bill for health insurance was drawn up for presentation to the legislature in 1934 and was finally passed on March 31, 1936, and was to have gone into effect on January 1, 1937. However, it is not yet in operation, chiefly because the coöperation of the medical profession, with the legislation as it was drafted, could not be secured.

In Alberta at about the same time, a commission of members of the legislature investigated the best methods of making adequate medical and health services available to all people in the province, and submitted its final report in 1932, and based on this report, a Health Insurance Bill was passed at the 1935 Session of the Legislature, but, as yet, has not been put into operation. However, at any time, this Bill can be brought into operation in either part or the whole of the Province.

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*Part of Conference on Medical Problems at annual meeting of the Minnesota State Medical Association, Minneapolis, Minnesota, June 2, 1939.

In none of the rest of the Provinces of the Dominion has there been any legislation enacted looking towards the provision of medical care on a Province-wide basis. In two Western Provinces, namely Saskatchewan and Manitoba, local communities in both Provinces have, over a period of twenty years, experimented with various schemes in an attempt to solve their own difficulties. This applied particularly to those communities in which very little, if any, medical care was available. From these attempts on the part of local districts to make provision for medical care, a scheme which is now known as the "Municipal Doctor Scheme" has evolved. This has so far progressed that we find in Saskatchewan approximately one-fifth of all the rural municipalities have a general practitioner's services applied in this way; while in Manitoba there are twelve municipalities now receiving medical care under this plan, with the likelihood of some six or seven more going into operation during the coming year.

As the name of the scheme implies, it means the engaging of a physician by a municipality on the salary basis, to give to the residents of that municipality medical care—such care to be any that may be given in the patient's own home or in the doctor's office.

A municipality in Western Canada is a local unit of government and has an area consisting of from 200 to 300 square miles, with a population varying from 1,200 to 3,000.

In Alberta, a very interesting scheme of Health Insurance has been in operation for a period of some five years. Back in 1934, the five doctors living in the town of Stettler, which is in a thriving community with an adequately equipped hospital and supported by a well settled farming district, discovered that although they were doing a tremendous amount of medical work they were not collecting enough money to make both ends meet. After considerable discussion amongst themselves they decided to institute a scheme of "health insurance" whereby the head of a family would pay in advance the sum of $25.00 a year, insuring for himself and all the members of his family medical attention in case of illness or injury. This medical service would be a complete one with the possible exception of the more technical type of specialist service. This scheme seemed to make a hit with the local people as nearly all who could locate the $25.00 joined. The money collected by the individual doctors was put into a common fund and at the end of the year was distributed pro rata to the physicians, depending upon the amount of and type of service rendered.

In speaking to one of the doctors a week or so ago I was informed that although in the beginning this was a voluntary system of health insurance, the local municipalities in this district are now asking that it be made compulsory in order that every resident in the district will be entitled to the same type of service. The doctors have agreed amongst themselves, if the scheme is made compulsory, that they will be prepared to provide the service for the sum of $15.00 per family, per year. This does not, of course, include drugs or hospitalization.

As yet there are no figures available from this experiment to indicate the type and amount of professional services required, although the doctors say that for the first two years they were probably over-worked, but now that all the chronic conditions have been attended to the types of illness they take care of has been relegated to those of a minor nature. As one doctor says—"It is very seldom indeed that we now have to make a trip to the country to see a sick individual, as the individual comes to the doctor, or hospital, before he becomes so ill that he cannot travel." It would seem that this type of practice might be extended considerably and should fill the real need where a group of doctors can work together. Under this plan the patient has choice of doctor and can only change his physician at the end of the year, or with the consent of both the new and old physician.

With the advent of the depression, consideration had to be given to the medical care of the unemployed, and this has progressed so far that we can assume the unemployed in Canada, as a whole, now receive a fairly adequate type of medical service. From a provincial standpoint this is probably best organized in Ontario, where the provincial government pays over to the medical profession a certain definite amount per head per month for unemployed persons and the medical profession, in return, sees that this group in the population receives the care it requires. The amount paid varies from 35 to 50 cents per head per month, which leaves 28 cents for medical care after deductions for drugs and administration are deleted. Although this does not give the physicians a satisfactory remuneration, it at least makes sure they are not out-of-pocket in providing the service.

The Ontario Medical Association divided the Province into eleven districts corresponding to the districts of the local medical societies. The physicians in each district form a local committee to supervise the service, and the money for the medical care of unemployed persons in their district is turned over to this Committee for distribution. All the physicians who have rendered service to the unemployed send in an account at the end of each month, using the regular schedule of fees, and the physicians' committee prorate the total amount available, depending upon the work done by each physician. This sum actually paid appears to work out at about 40 per cent of the accounts submitted under the regular schedule of fees. The services provided are a general practitioner's services.

In Winnipeg, Manitoba, in 1933, the profession decided that some arrangements would have to be made for the providing of medical care to the unemployed, since up to that time this group had been carried by the profession as charity cases. After nearly a year of negotiations with the city, an arrangement was entered into, which set up a system of medical services to the unemployed, under medical control, with a special schedule of fees of approximately one-third to one-half the rates usually charged and this arrangement still continues. The service supplies everything that might be required by the unemployed person, including drugs and some dentistry. The individual needing the service has a choice of physicians but, excepting in case of emergency, is required to get authority from the medical relief officer to call his doctor. The physician, on taking over a case, has to immediately notify the medical relief officer. This notification is on a special form which gives information in reference to the type of the illness as well as to the amount of medical care such illness may require. The service is not claimed to be a complete one, for it is only supposed to take care of acute and subacute conditions. However, it has developed until practically everything from which the unemployed person may be suffering is looked after by the profession at the expense of the city. The service is under complete medical control through a medical advisory committee who have authority to settle all disputes which may arise in connection with the service. This committee consists of the city medical officer of health, the city relief medical officer, the chairman of the committee on sociology of the Manitoba Medical Association, and one other member of the Association. This service has extended until now practically all municipalities in Manitoba give to their unemployed the same type of medical care, under the same plan—payment being made, on a fee basis, to the physician for all work done, using a special schedule of fees. The information obtained from the returns of the physicians under the plan in operation in Winnipeg has been tabulated from year to year, and we are now obtaining a collection of statistics which will be of real value in estimating, for an urban community, the amount and type of illness and its requirements in terms of medical care.

The accompanying tables contain certain statistics which we think should be of interest.

We have felt, in Manitoba, for a considerable length of time, that the statistics we get in reference to the amount and type of illness in urban communities are such as would enable us to set up an actuarially sound scheme of Health Insurance for an urban population if and when the public should demand it. However, our information in reference to the requirements of our rural population is entirely inadequate if we should be requested to have any scheme embrace the whole of the province.

The Municipal Doctor plan of supplying medical service is now well stabilized in Manitoba, in that we have adequate legislation to control it and this control rests directly where we believe it belongs, namely in the medical group in our governmental organization, the provincial department of health and public welfare.

TABLE I. COMPARATIVE SUMMARY OF MEDICAL SERVICES TO PATIENTS ON RELIEF

	March 1, 1934, to Feb. 28, 1935	March 1, 1935 to Feb. 29, 1936
	Total for year	
Calls:		
House	15,987	19,721
Office	22,265	26,667
Hospital	8,065	7,889
Operations:		
Major	519	581
Minor	920	1,204
T. & A.	727	628
Fractures	33	178
Maternity:		
Hospital	702	728
House	137	145
Sundries:		
Special Examinations	243	292
X-rays	193	246
Anesthetics	234	425
Dental	1	...
Consultations	266	376
Radium—rental	...	14
Radium—treatment	...	9

TABLE III. MEDICAL SERVICE TO UNEMPLOYED IN CITY OF WINNIPEG (1935-37)

1. Average number on relief 30,531
2. Number of illnesses:
   Total yearly average illnesses..............22,131
   Average illness per person per year...... 0.73
3. Days of hospitalization (1935 & 1937 only):
   Average per person 1.14
4. Death-rate per 100 population (1936 & 1937 only):

Age groups 1-60	Specific death-rate of relief population	Specific death-rate for city of Winnipeg
adjusted rate	2.47	3.10

Note: In considering "death-rate" we deleted age 0-1, as we understand that no deaths of infants in hospitals following maternity cases were credited as relief deaths. Relief rate in this age-group was only half of the Winnipeg rate. It must be remembered also that the relief groups are not exposed to industrial hazards.

TABLE V. MEDICAL SERVICES TO UNEMPLOYED IN CITY OF WINNIPEG (1937)

COST OF SERVICES RENDERED

(Special reduced schedule of fees)

Average number of persons on relief	27,875
Average number of illnesses per person	0.92
Average cost per person for doctor's fees (gross)	$4.20
Average cost per person for hospital services	3.53
Total average cost per person (including special services paid and unpaid)	7.73

TABLE II. PRINCIPAL CAUSES OF ILLNESS

Cases per 1000 persons

Digestive system	61.5
Tonsillitis and sore-throat	52.7
Respiratory diseases	52.5
Diseases of skin	30.7
Confinements and other puerperal conditions	29.7
Accidents and other external causes	28.9
Heart and other circulatory diseases	22.8
Disease of nervous system	19.5
Non-venereal diseases of genito-urinary system	18.4
Lumbago, arthritis, and rheumatism	16.9
Measles	16.5
Diseases of ear and mastoid process	13.0
Diseases of kidney and adnexa	10.7
Diseases of eyes	6.0
Pneumonia	5.9
Diphtheria, scarlet fever, and typhoid	3.4
Tuberculosis, all forms	2.1

TABLE IV. MATERNITY SERVICES TO UNEMPLOYED IN CITY OF WINNIPEG (1935-37)

1. Average Number of Pregnancies per Annum

Pregnancies	Hospital	Home	Total	Per cent abortions
Full term	583	60	643	26.4
Abortions	71	99	170	...
Total	..	..	813	20.9

2. Birth-rate per 1000 Population

Relief 20.2	City 12.4

Note: All abortions received medical care and were thus reported. Percentage of abortions is new in statistics and may give us some idea of the abortion situation.

The control is exercised over the formation, size, and population of the proposed municipal doctor's area, the doctor's salary, and the terms of his contract. A standard contract, which remains in force for the duration of the Municipal Doctor By-law, is now in operation and makes certain provisions which we think are essential if the public and the practitioner are to receive proper consideration. It sets out in detail the duties of the doctor. The contract also makes provision for leave for the physician each year with pay and an increased leave every second year with pay in order that he may go for short post-graduate courses. Provision is also made for permission to attend all district and provincial medical association meetings without loss of salary. In this way we hope to keep up to date those physicians who find this type of work attractive.

TABLE VI. MORBIDITY STUDY—MUNICIPAL DOCTOR AREAS—MANITOBA (MAY 1, 1939-APRIL 30, 1939)

ILLNESSES REPORTED AND TREATED IN AREAS

Sex	Medical	Surgical	Fractures	Childbirth and Puerperal State	Special	TOTAL CASES
Male	3,094	175	61	...	205	4,085
Female	2,996	450	18	232	142	3,838
TOTAL	6,090	1,175	79	232	347	7,923

Average illness per resident—.52

TABLE VII. MORBIDITY STUDY—MUNICIPAL DOCTOR AREAS—MANITOBA (MAY 1, 1938-APRIL 30, 1939)

SERVICES RENDERED BY MUNICIPAL PHYSICIANS

Number of office calls	9,728
Number of house calls	3,880
Number of hospital calls	877
Special services (x-ray, laboratory, refractions, dental, etc.)	899
Total miles traveled by municipal physicians	36,010

In order that the doctor may not be at the mercy of a lay governing body; provision is made in the contract that he cannot be discharged without three months' notice, and if he is of the opinion he is being discharged without cause he has a right to appeal to an advisory board consisting of three members—one representing Organized Medicine, one representing the Department of municipal affairs and a third chosen by these two. The decision of this board is final and binding on all parties.

From a public health standpoint a municipal physician makes an ideal health officer, because he finds it to his advantage to use to the fullest extent those methods now available for the prevention of disease. In these municipalities there is complete immunization against diphtheria and smallpox and, in most of these areas, also against scarlet and typhoid fevers.

The municipal doctor usually provides a fairly adequate school medical service. Prenatal care of expectant mothers is well looked after. There being no financial barrier between the mother and the physician, she seeks advice and any medical care she may require.

TABLE VIII. MORBIDITY STUDY—MUNICIPAL DOCTOR AREAS—MANITOBA (MAY 1, 1938-APRIL 30, 1939).

HOSPITALIZATION AND DISABILITY

HOSPITALIZATION:	
Number of patients admitted to and discharged from hospital	355
Number of hospital days	4,273
Average days per patient	12 days
DISABILITY:	
Total days of total disability (persons six years old and over)	23,032
Average days per case of illness	2.9
Average days per residents	1.5

TABLE IX. MORBIDITY STUDY—MUNICIPAL DOCTOR AREAS—MANITOBA (MAY 1, 1938-APRIL 30, 1939).

HEALTH SERVICES RENDERED

Vaccinations	2,455
Diphtheria toxoid immunizations	1,953
Scarlet Fever Immunizations	350
School examinations	1,263

With the assistance of The Rockefeller Foundation and the Department of Pensions and National Health, Ottawa, and Organized Medicine in Manitoba, the Department of Health and Public Welfare of Manitoba is conducting a two-year study in those areas employing a Municipal Physician, to ascertain the types and amount of sickness amongst our rural people, as well as the requirements both financially and otherwise for a complete medical service amongst this group in our population.

The group being studied consists of approximately 15,000 people, which we think is representative of the rural population in Manitoba in that it contains various nationality groups on farms, in small hamlets and villages in various stages of economic well-being.

This group is served from a general practitioner standpoint by seven municipal doctors, and as there is no financial barrier between the doctor and the patient, we should get an accurate record of every condition from which an individual may suffer which he thinks requires medical attention. We will also, on the other hand, know that they are not receiving more attention than they require, although possibly, as we all know, a good many patients may demand this. This study has now completed its first year's operations and we have some interesting statistics on the subject.

I cannot conclude these rather rambling remarks without making some very definite statements in respect to the whole question of state provision of medical care. Although people may demand such a service, it will be no easy task to insure that it is likely to be anywhere near 100 per cent satisfactory.

Amongst the things which have to be given very careful consideration from the standpoint of supplying adequate and up-to-date medical care to our people are the following:

1. Is the training now being provided in medicine such that the various types of service required by the population can be adequately provided at the price which they can afford to pay?

2. Is it not possible that if a service is provided free to our population the total cost of such service is going to be immediately tremendously increased and the burden become such that the taxpayer will be unable to foot the bill?

3. Will not demands be made upon doctors by patients, when there is no financial barrier between patient and doctor, that the patient receive a great deal of medical care which possibly is not required?

4. If a doctor is paid on a salary basis what must we do to see that he is going to keep himself what might be called "medically fit"? I mean by that, abreast of the knowledge made available through the advancement of medical science.

5. If the provision of medical care becomes a state service, is it not a possibility that it may become through manipulation a "political football"?

However, despite all these possible drawbacks I am fully convinced that the time is quickly coming when public demand will compel public officials to provide some such service, and whether we as the medical profession like it or not we will, in our desire to protect the public, be forced to coöperate in setting up a scheme or schemes, and it would seem to me that some of the things that we should insist upon are:

1. The medical end of any such scheme must be under direct medical control, either through the medical personnel directly connected with the official health services of the state or province, or through organized medicine, or through the combination of both.

2. I personally do not believe sick-benefits, which we find tacked on to almost all systems of state provision of medical care, should be the concern of the profession. In my opinion, certification for sick benefits puts a responsibility on the medical man which is bound to have an effect on his ability as a practitioner and also on his integrity as a citizen.

3. We as a medical profession must insure that any scheme for the state provision of medical care must be wholly interlocked with the organized efforts of Public Health Departments so that all those in the practice of medicine will continue to stress, to an ever increasing extent, the aspects of medicine which have as their ultimate goal prevention of disease and preservation of health.

Mental Attitude of Tuberculous Patients

The mental attitude of tuberculous patients is not one of optimism. In observing approximately 2,000 patients with tuberculosis, of whom seventy-five were closely studied, the prevailing moods were found to be depression, fatalism, anxiety and apprehension. It is recommended that extreme care be used in advising patients of the extent and nature of their disease and suggested that more attention be paid to the psychological care of those in tuberculosis hospitals.—STRECKER, E. A., BRACELAND, F. J., and GORDON, B., *Mental Hygiene,* October, 1938.

HEALTH OF THE PEOPLE OF MINNESOTA*

W. A. O'BRIEN, M.D.

Medical Director, Center for Continuation Study, University of Minnesota

Minneapolis, Minnesota

MY SUBJECT is a discussion of the health of the people of our state. The meetings we have had during the last three days have been directed toward the improvement of the health of the people of Minnesota. In fact, meetings of the hospital and medical associations are directed toward this purpose. Those who have visited the health exhibit in the basement realize it was put there for the primary purpose of bringing to the people of the community the facts of medical science. The radio program we maintain is also for this purpose. It is rather interesting to note in regard to the health education of the people of this state that during the eleven years I have had radio programs, no one has told me what I must say. These talks have been given to bring news and the latest and most important facts of medical science.

In order to realize how medical service is changing, I would like to draw attention to the objectives of modern medical practice. Modern medicine, differing from that of a few decades ago, has as its primary purpose objective information and action. You noticed how Monsignor Griffin made use of facts and figures in arriving at conclusions. There are many people who do not understand this particular approach. There are certain ways in which we must interpret the material if we are to get the right answer. It should interest us all to remember that modern historians tell us that we are going down in history not as great artists, teachers or inventors, but rather as the first group in civilization to accurately measure its information and thereby draw pertinent conclusions.

Second, the modern medical approach to any disease is systematic. We proceed from the history to the physical examination, the laboratory tests, the tentative diagnosis, recommended consultations and treatment. Many lay people ask us to look, observe and act, very often to act before looking or observing. In many instances this has given the wrong impression to some people. When the discussion of periodic health examinations was up a few years back, it was my opinion that if we did three things we would give an ideal examination: (1) the junior medical student would take the history; (2) the senior medical student would make the examination (no short cuts); (3) a skilled physician would be called to interpret this information, and to him we would have to look for medical direction of the care of the people.

If a wealthy man in New York City has an attack of coronary disease, he is taken to a hospital in an ambulance and given a sound-proofed private room. Near at hand are many nurses. He is put into an oxygen tent. His business associates carry on for him at the office. His family is given rooms near him. An electrocardiogram is taken. He receives systematic medical care. Let us now go to a remote section of Minnesota. Here we find a man stricken in the field and carried to his house. The physician who calls does not have the privilege of using an electrocardiograph. He takes the history, does the physical, raises the window and fans the man. The wife is called in and instructed as to what to do. The public health nurse drops in from time to time to help the family care for him. Friends look after his crops. This man is given the same systematic approach, varied according to conditions and according to his needs. There are those who do not understand that our man in Minnesota is not being neglected.

Group care in the responsibility of diagnosis and treatment is new. I do not refer to groups of physicians but trained workers in the hospital field. As Monsignor Griffin tried to show, medicine in Minnesota is being practiced in centers and hospitals. Doctors, nurses, medical technologists, record librarians, administrators, dietitians are all coming in now to learn the advances in their particular field. With the division of labor in the hospital and medical field, the care of patients is better now than it ever was. Let us take nursing. The first time a nurse made a bedside record, she watched the patient through the night and when the doctor came in the morning, she told him how the patient was. In the middle of the conversation, she hesitated, then pulled out her notes. From that day on the hospital chart was made as a record of conditions in the doctor's absence. The practice of nursing today, in many ways, is the practice of medicine a few years ago.

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*Presented at the Conference on Medical Problems at the annual meeting of the Minnesota State Medical Association, Minneapolis, Minnesota, June 2, 1939.

In our own state we see medicine striving for a solution to its problems. We see it systematically applying things it learns as groups working together for a common objective. We have in the Northern Pacific Beneficial Association, one of the oldest of its kind in the United States. Our society endorses the care of the tuberculous, nervous and mental diseases by the state. Remember that all those different systems exist side by side with the whole-hearted approval of the medical profession. We are not narrow-minded and are willing to see that public health and medicine advance side by side. I have listened with pride to practitioners discuss public health problems which have arisen in their communities and which they were anxious to help—to help a family with the pasteurized milk problem, immunization in school. No, we are not against public health.

Our State Department of Health is the finest in the country. Its laboratory for the diagnosis of contagious disease has received commendation, so that in Minnesota, speaking for both the medical and hospital groups, we are eager to see that public health advances, also to see medicine practiced at its best.

We do not hold back because of embarrassment to physicians who have not kept up. We expect our members to keep up. The University of Minnesota is trying to help both the doctors and hospital people to learn of the recent advances in their field. I refer to the Center for Continuation Study, which during the past two and a half years has had thirty-seven courses in medical and hospital subjects with an enrollment of 1,182; 432 hospital and 750 medical registrations. If you will look at communities in Minnesota, you will find community after community where the physicians and hospital people have gone to the University to attend a course at the Center for Continuation Study. We are proud of our record because so far as we have been able to learn, it is the first of its kind in the United States.

We are a free people and we will continue to be free as long as we are allowed to develop. We feel that we are bringing to the people of Minnesota the type of medical service that will receive the approval of all, and with the closer coöperation between the medical and the hospital field we hope to obtain even better results.

THE NATIONAL HEALTH PROGRAM*

MONSIGNOR MAURICE F. GRIFFIN
Cleveland, Ohio

IT ought to be taken for granted that any movement to improve the health of our people would find its most enthusiastic reception in that group of men and women who have dedicated their lives to the care of the sick. The hospital organizations, made up of the traditional and accepted leaders of the American people in this field of human endeavor, have, throughout their history, coöperated in every forward looking movement for the welfare of the people.

It seems necessary to restate this well known fact because a new concept of social security gives small recognition to the achievements of this group and attempts to supplant professional with social control in a new national health program.

Our three hospital associations agree that "any plan of hospitalization should be built on an appreciation of the extent and the excellence of the present hospital system and should begin with the greatest possible utilization of existing facilities."

The great majority of the American people are within easy reach of these hospitals. It makes little difference whether we accept the statement of the American Medical Association, corroborated by the American Hospital Association that 98.5 per cent of the people of this country are within thirty miles of a hospital, or whether we take the statement of the technical committee that it is only 87 per cent that is so close. The fact remains that the great majority of the people without serious delay or inconvenience can be brought to an existing hospital.

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*Part of the Conference on Medical Problems at the annual meeting of the Minnesota State Medical Association, Minneapolis, Minnesota, June 2, 1939.

As for the rural sections of the population contiguous to the population centers, all recognize that they go there for their recreations, their shopping, and their hospitalization. Neither personal habits nor sickness have any inhibitions concerning county lines. Distance is only relative. With good roads and modern individual transportation the isolation of the farmer passed forever. We cannot ignore his preferences and his customs. We cannot discount his social progress. Our rural people are educated to want the best the city can give them and they go there to get it. I am not unaware of the agreement of certain representatives of rural groups with the National Health act, but I cannot believe that the modern, up-to-date farmer will be satisfied with an inferior type hospital just because the government will build it for him at his crossroads.

Great fleets of busses bring his children to the centralized school. Modern luxurious ambulances travel the same broad highway bringing patients to existing hospitals that are completely equipped with the newest and best, and completely staffed with an efficient professional personnel. The University of Iowa Hospital has twenty-five such ambulances on the road every day, bringing patients in from each of their ninety-nine counties three times a week. Canada supplements her auto ambulances with fifty planes. Australia and all of the progressive countries are doing this. They have established a high standard of service for their rural population and they are bringing their patients in to the hospitals that can render that service.

Hospitals, like other service institutions, cannot be built on geography alone, no matter how much we glorify county lines. Adequate population and patient demand are determining conditions. Experience and law of averages tell us that just about so many people out of a thousand are going to be sick at about the same time. From the standpoint of expensive equipment and especially professional personnel, a hospital has to be large enough to make these things possible. In order that a hospital may be reasonably well filled it is necessary to have a definite ratio between the number of beds and the number of people in the area served.

There is much discussion concerning the required number of beds per thousand of population. The Technical Committee announced that 4.5 beds per thousand was the standard requirement for the whole country, and their plans for construction are on that basis.

In contrast I would like to submit the following. In Cleveland, a large industrial city where the incident of hospitalization might be expected to be high, with the additional attractiveness of being a great medical center, it is only recently, with our new hospitals and new additions, that we have come up to five beds per thousand. Several of our hospitals have a very considerable number of outside patients. One has had as high as eighty-five per cent of its patients from outside of the county. I know of another hospital in a neighboring state, and it is not a famous one either, where the patients last year gave 369 different postoffice addresses. I quote these facts as an indication that any estimate based on county figures is fallacious.

The Commonwealth Foundation, building hospitals in rural areas exclusively does not encourage the building of even a fifty-bed hospital in any area where there is not at least 50 or 60 thousand people to be served. In a dozen years they have never felt the need of enlarging one of their hospitals, and most of them are operating on a low percentage of occupancy. One bed per thousand of the rural population seems to be more than sufficient.

Here are some new figures that have just been compiled of our subscribers to the Hospital Service Plan. This clientele is without doubt the most hospital minded group in the country. They think enough of hospital service to pay for it beforehand. They have no financial reason for hesitating to go to a hospital because their bills are already paid. The enrollment is mostly in urban districts where the city environments make for increased hospitalization. In a word, the incident of hospitalization in this group should be the highest in the country. After the unprecedented demands of the last three months the average is again 0.85 days care per subscriber. This means 850 days care per thousand of population, or 110,500,000 days for our entire 130,000,000 people. On a 75 per cent occupancy basis this would require little more than 400,000 beds. Not counting federal, state, county and city institutions, we now have more than the number of beds needed in the voluntary hospitals alone, and that number is increasing at the rate of 25,000 a year—an indication that the well-springs of charity are not dried up. On this basis there does not seem to be much need of a greater total number of hospital beds.

Concerning new construction, our association recommends the following, where there is lack of facilities due to a local fault of distribution:

> "New hospitals should be built in urban and rural areas only after an accurate impartial survey of population grouping, accessibility of existing facilities, transportation, availability of professional personnel and economic resources, shows that new institutions are needed and that they could be maintained according to good professional and financial standards."

The National Health Act provides for the building of hospitals with government funds in rural areas and in areas suffering from severe economic distress—that is in the cities where there are plenty of hospitals now. These new government hospitals are to be available for all groups of the population, not merely for the indigent. Everything is for everyone, everywhere. Whatever the need of extending hospital service may be, it does not justify such a revolution. All of the hospital service required by the American People can be provided in existing institutions, and in new hospitals wherever required under existing laws and under local control.

The voluntary hospitals can continue to take care of the great majority of our people who can and who should pay their way. They can continue to take care of as many free patients as their means will permit. An appropriation from relief funds would extend that service. Even those in low income brackets now have a satisfactory formula offered them in the prepayment plans of the hospital service associations. In taking a broad social view of the nation's health, we must not overlook the primary consideration, that an individual's health is absolutely personal to him. Life is one of the inalienable constitutional rights of the citizen, but it is also one of the greatest responsibilities of the natural law, the care of which cannot be shifted to another. Only when a citizen needs assistance in providing food, shelter and other items of relief, should he expect the government to give him hospital service gratis.

We now have many government general hospitals, in county, city and the U. S. Public Health Service Veterans Bureau. Some of these institutions, built by tax funds for the care of the indigent, have departed from their original classification and are extending their facilities to those who are well able to pay their way and who should not be a burden on tax funds. Some of these institutions have duplicated satisfactory available facilities in existing institutions in their areas, which is economic waste. The number of these general hospitals has increased greatly in recent years. During the depression they have been enlarged, remodelled, and reconditioned by federal funds. Any further extension required and justified can be provided in the same manner, by matching federal and local funds, by grants-in-aid to local governmental units.

We insist, however, that building more hospitals will not solve the problem of adequate hospital care, not merely *for,* but especially *to* the American people. There are now more than 100,000 empty beds available in our hospitals. If simply having beds could solve the problem—it would have been solved already.

There must be a different approach to the problem.

Irrespective of all financial considerations, there are two classes of people concerned; those who help themselves and those who do not, those who try to get hospital care when they need it, and those who do not try. Those who are needing treatment, who are taking the initiative, who are applying to a hospital, are being taken care of, as a general rule. Here or there a hospital may have reached the limit of its resources; in fact, the burden of free care during the depression caused many of them to close.

But to carry the ideal of hospital care *to* all of the people we must develop an organization to go out and get the backward ones and bring them in when they need it. This is a program of education, of instructing them on the benefits, bringing new hope to them in their affliction, removing their inhibitions, changing their attitude towards hospitalization. The visiting nurses, the district nurses, social service workers, many other voluntary agencies are carrying on a most commendable effort along this line. This should be extended into all sections of the country, into the rural areas, into the cities, where there are people who do not make their wants known. When the hesitancy is of a financial nature, it can be removed by making a relief appropriation that will supplement the resources of private charity and make the services available for all of those who cannot pay, and who hesitate to apply for this reason.

So we get back to the beginning, the recommendation of the hospital association that the National Health Program should begin with the greatest possible utilization of the existing facilities and the proper remuneration for the same.

This problem remains as acute today as when the relief administrator assumed all the other burden for the millions of indigents and refused to pay for their hospitalization. That is why the hospital associations protest the conspiracy of silence concerning this great national need in the new legislation known as the National Health Act of 1939.

The Wagner Bill (S1620) is a cruel awakening for that noble group of hospital people who have given America a better service than any other nation knows. It is a ruthless disillusioning for these public spirited citizens who trusted the administration's social reforms.

President Roosevelt in his letter to the National Health Conference in July, 1938, pleaded for "The most efficient coöperation of federal, state and local government, voluntary agencies, professional groups, et cetera."

The printed word of the Technical Committee states, "It goes without saying that a national program must be built upon and utilize fully all present resources" and "The use of non-government hospital beds paid for on a proper basis by public funds is presumed as a part of this program." (Pg. 56)

Chairman Altmeyer addressing our convention in Dallas pointed out "that so many beds are empty because those who should occupy them cannot afford to pay" and adds "That the committee recommendation would help fill empty beds in existing hospitals through grants-in-aid for hospital care of persons unable to pay."

These and similar statements were made to our joint committee, representing all hospital associations, in Washington Conference, and by various representatives of the Interdepartmental Committee at many hospital meetings.

Then came the long expected legislation to put all these recommendations of the Interdepartmental Committee into effect: The National Health Act of 1929.

There is not the faintest indication in this bill that those who inspired and drafted it are aware of the traditional relations, or as the President says, the partnership between public and private agencies concerned with the general welfare; there is no slightest appreciation of the monumental contribution to our national well-being made by the present hospital system; there is no word of authorization to anyone from the Surgeon General down, to enter into a contract with an existing institution or with the agencies for whose coöperation the President pleaded so eloquently and to whom Mr. Altmeyer and the others so definitely promised aid. Among the hundreds of millions authorized to be appropriated for the construction of new governmental hospitals, and among the untold millions that are authorized to be appropriated "in sums such as may hereafter be deemed necessary for the purposes of this title," there is not one cent authorized to be appropriated to any private agency for any service whatsoever under the title of Grants of the states for hospital purposes.

Aside from this serious breaking faith with the hospital organizations, there is an even more serious implication—the injustice to the people.

The program we suggest could become effective at once without any delay of construction. It would benefit the great majority of the people in the large centers of population where the economic stress presses most heavily, and it would give the rural population better hospital service.

The American Hospital Association, the American Protestant and Catholic organizations had the privilege of appearing before the subcommittee of the Senate conducting hearings on this bill recently. The chairman, Senator Murray of Montana, very graciously gave the hospital associations the privilege of arranging their own programs to take the entire afternoon. He further, in a most complimentary manner, as soon as he heard our committee was in session the day before, came over and gave us his evening so that in an informal way we could sit down and talk over this proposition with him, and it is no breach of confidence to say a new proposition to him. Senator Wagner of New York, who gave his name to this bill, paid us the same courtesy. As soon as he heard that we were meeting, he came to our hotel and with Senator Murray spent the evening. Everything that I have said to you I said to them personally, and every point that we had brought out in the interdepartmental committee, we brought out to them, and we explained to them the deficiency of of that legislation and the necessity for remodeling it, to which Senator Wagner very enthusiastically agreed and requested a further conference with us so that the interest of the existing hospital system built up by more than 200 years of service by the voluntary public-minded citizens of the United States will be preserved and this great cultural asset to the American people will not be destroyed. We began on the twenty-eighth of February, when we got the first copy of this bill, to write amendments to it. Personally I have written fifty, another member of the committee has written thirty-six, a third has written twelve more. I think we can get together and boil them down. I think, as I have talked from the beginning, with the friendly spirit exhibited largely on a personal basis by members of the United States Senate who have charge of the program now that it has left the interdepartmental committee, that the difficulties can be eliminated—with one exception—and I have left that to the last. Each one who appeared before the Senate hearings mentioned, and by the way we followed the secretary of the organization that spoke for compulsory health insurance without using the word "compulsory," was asked point-blank by one of the senators: "What is your attitude toward compulsory health insurance?" Now I say to you members of the medical profession and those interested in hospital service of the country, what is your attitude toward compulsory health insurance? You cannot dodge the question. The most important implication of the National Health Act is that it makes it possible for the states to establish compulsory health insurance. The federal government does not do so because a question of policy dictated that it would be safer to let the states do it than to try to force it in the beginning from Washington. Compulsory health insurance for all citizens except perhaps those in the highest income brackets. Every proponent of this measure that I have heard agrees that under S1620 in its present form a state can spend all of the federal grant if it wants to with the approval of the authorities in Washington for a program of compulsory health insurance.

Can the voluntary hospital as we know it survive under these conditions? Practically all of the patients would be paid for by the government at rates set by the government. The doctors would be on the government payroll, and under no obligation for their staff appointment to the hospital. Administrative difficulties and professional problems arising from complete financial control by the government and political domination of the practice of medicine would make it impossible for our excellent institutions to continue on their present high plane of service.

It is the death blow to our present hospital system.

HEALTH AND THE AMERICAN STANDARD OF LIVING*

F. STUART CHAPIN, Ph.D.

Professor of Sociology, University of Minnesota

Minneapolis, Minnesota

IN these days of rapid social change, a perspective of trends is sometimes useful. An over-all view helps us orient ourselves with respect to stable points in the social situation. In the attempt to secure this orientation we should consider the larger facts of our population, national wealth and income, taxation and social reforms, and the psychology of our people. The purpose of this paper is to briefly review these facts and some opinions about them.

The American standard of living is the highest in the world, both today and in comparison with any other period. Our almost unlimited natural wealth for the past 300 years has created in our people the firm expectation of a rising standard of living. Even the present generation has seen an increase in estimated national wealth of from 88 billions of dollars in 1900 to an estimated wealth of 350 billions of dollars in 1938.[5] This expectation of continued future increases in the American standard of living at past rates of increase needs to be soberly examined in the light of present facts.

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*Part of Conference on Medical Problems at annual meeting of the Minnesota State Medical Association, Minneapolis, Minnesota, June 2, 1939.

The American frontier is now ended. While it lasted it was always possible for excess population of eastern cities and unemployed persons to find a living, self-support and often wealth. Now that this resource is ended, it closes a chapter in our history. When we turn and examine the world markets we discover that they are declining as outlets for our surplus products. We have vast supplies of grain and cotton in storage. Finally as we turn to examine the domestic market for the sale of goods among our own population, we discover that our national population is rapidly approaching a stable number, and by 1960 or 1970 it is estimated that population will just about maintain itself at 150,000,000.[13]

While these changes in the ratio of population to wealth have been going on, invention, scientific discovery and mechanization of all forms of industry have proceeded apace so that today we can produce the wealth we do produce with fewer and fewer workers. This is a trend not confined to labor. Already there are signs of overcrowding in the professions.[6] In 1933 the average incomes of consulting engineers had declined 62 per cent, the average income of lawyers had declined 30 per cent, the average income of physicians and surgeons had declined 43 per cent, and other professions in more or less degree.[15] Widespread unemployment of trained professional persons who have been educated at great cost and sacrifice for non-manual vocations, leads inevitably to frustration and discontentment and often radicalism follows as a natural compensation or as an escape from reality. In so far as our educational philosophy and practice has encouraged each generation to believe that the ideal life for the intelligent person was in non-manual pursuits, we have brought this upon ourselves; but in so far as widespread economic depression and frequent business cycles have operated to throw many out of employment, we have been caught in complex social forces not yet fully understood.

Against this larger background what are the present facts of income and wealth of the American people? It happens that for the year July, 1935, to June, 1936, we have the most accurate statistics ever available on consumer incomes in the United States.[8] These data were gathered under the most competent direction from several hundreds of thousands of American families selected to represent a fair sample of rural and urban living conditions. The year 1935-36 was a twelve-month period in which the *New York Times* business index rose from 82 per cent of normal to 98 per cent of normal, so that although there was much unemployment and relief during the period, business experienced some real gain which was doubtless due in part to "pump-priming" or government spending for recovery. In this year of business recovery it was found that one-third, the lower third of our population, had incomes of less than $780 per year; the middle third had incomes of from $780 to $1,450 a year; and the upper third had incomes of from $1,450 a year up.[8] If we examine the extremes, we find that the lowest tenth of aggregate income constituted 32.3 per cent of the people and had incomes of less than $760 per individual or family, whereas the highest tenth of aggregate income constituted one-half of one per cent of the population, and their incomes ranged from $14,600 a year and up.[8] I have estimated the aggregate national income of the United States for the twelve-month period 1935-1936 as $58,785,000,000. Assuming a population of about 128,000,000 for that year, we would compute the rough per capita income for 1935-36 as $459. For a family of four persons this would amount to $1,836 a year if the national income were equally divided among the people. What now would be the situation of different social classes related to this per capita income of $1,836? The source I have quoted shows that the wage-earning class, constituting 37.9 per cent, had in 1935-36, 42 per cent less than this income on the average (or $1,289); the farming class, (24.8 per cent of the population) had 45 per cent less (or $1,259); the clerical class (14.5 per cent of the population) had 3 per cent more (or $1,901); other classes that formed small proportions of the population were in a much more favored position. Salaried business

(4.5 per cent of population) had 129 per cent higher incomes than this; independent business (9.5 per cent) had 38 per cent higher incomes; salaried professional (4 per cent of population) had 68 per cent higher incomes; and independent professional (1.4 per cent of population), had incomes 266 per cent higher than $1,836 a year![8] Of course none of these figures take account of the incomes of those in relief or on WPA, for the reason that these figures describe the individuals and families engaged in new wealth production by regular employment. Those on relief and WPA are a large and important part of our population, but since they are supported from the surplus income of those who are employed, it is to the population having definite income that we must turn for a picture of trends and social situation.

How would a family of four spend an $1,836 income? It just happens that the average current expenditure of all families studied in New York city was $1,839, almost exactly the amount of the per capita income. The average number of consumption units was 3.38 persons. On this income, 36.4 per cent went for food, 20.9 per cent for housing, with 4.9 per cent for fuel and light, 11 per cent went for clothing, recreation took 6.2 per cent, and medical care cost $64 a year, or 3.5 per cent.[9] In general, a family at this income would spend $245 a year, or 13 per cent of their income, in hidden taxes or in indirect taxes.[10] It is estimated that for every $10.41 spent for medicines, there is $4.22 collected among 172 hidden taxes. Outside of New York, families at this income may spend 13 per cent for rent, or $20 a month, or $240 a year. House operating expenses run 7 per cent more, or $127 a year. At $20 a month for rent a house costing $2,400 could be occupied at profit to a landlord, or purchased by the tenant; and recent estimates of building costs show that a good small house can be built for $2,400.

The foregoing figures show clearly what the American standard of living could be for everyone if wealth were evenly distributed. No well-balanced person believes that such an even distribution of wealth is either desirable or possible. It is, however, somewhat interesting to examine the idea in concrete terms of actual consumers' incomes and expenditures. But whatever one may think of different theories of wealth and income distribution, the fact remains that we are living in a time when a redistribution of incomes among our people has taken place and is now taking place. The facts of this phenomenon need to be examined.

Since the depression, and particularly under the direction of the New Deal, we have been experiencing a redistribution of income along three different lines.

1. A redistribution of income has taken place between sections of the country. For example, the distressed areas of the "dust bowl" and the Dakotas have received much more in all forms of Federal relief than they have yielded Federal taxes in return.

2. A redistribution between the employed classes and the distressed classes by way of relief payments, WPA, aid to dependent children, old age assistance, unemployment benefits, housing for low income classes and expenditures for public health.

3. A redistribution of income between periods of time is taking place by way of huge increases in the public debt, local, state and Federal, in the form of borrowing against future national income. In 1900, with a total national wealth of 86 billion dollars, a population of 76,129,000, we had a total public debt of about 2 billion dollars. Compared with this, we have in 1938 with a total national wealth of 350 billion dollars, a population of about 130,000,000, a total public debt of about 60 billion dollars! These represent respectively increases of 300 per cent in total national wealth, 70 per cent in population, and 2,000 per cent in debt!

How long can these trends continue? A public debt of 60 billions of dollars just about equals the total national income of the United States for the year 1936 or for the year 1938. The pay-off on this debt is a charge against future national income, and this means against our individual incomes. Taxation is the method whereby these obligations will have to be met sooner or later if the solvency of the government and private enterprise is to be preserved. What are the limits to this redistribution of wealth (income) process, assuming the preservation of the social order? In 1935 direct taxes on large incomes in the United States were higher (70 per cent on 5 million dollar incomes) than in England (60 per cent on 1 million £ incomes). Direct taxes on low incomes ($1,000 or less) in the United States were zero, as compared with

25 per cent taxes on similar incomes in England.[1] Inheritance taxes in the United States were higher on large estates (60 per cent on 50 million dollars) than in England (48 per cent on 50 million dollars). On small estates United States taxes were less (75/100 per cent on $20,000) than in England (3.6 per cent on $20,000).[1] Evidently the trend in this country will necessarily be in the direction of increasing direct taxes on lower incomes since history shows that European countries tend to lead the way in taxation that the United States follows sooner or later. So much for the rough numerical limits. Are there any other limits? Yes, it would seem that the larger limits are psychological. One is the preservation of individual morale and the other is the preservation of the social order. To preserve individual morale we must discover by experimentation with relief and social services the minimum amount needed to avoid the breakdown of individual morale that would result in hysterical radical movements, irresponsible reforms and revolution. To preserve the social order we shall have to determine the maximum amount of tax revenue that can be collected without undermining confidence in the credit of government and business, and thus avoid widespread bankruptcy. Since this margin of safety is influenced by conditions outside the United States, new discoveries and inventions, and other factors that can not be accurately predicted, we are forced to find the limits of this margin by experimentation. In a larger sense this is just what the New Deal experiments have been striving for. Since the modern world is very complicated and growing more so faster than our knowledge of social organization expands, it is a matter of opinion as to where this middle course lies. Expert opinion of economists, political scientists and sociologists based upon facts, will help some, but public sentiment will in the last analysis set the limits. This is why the public opinion polls of *Fortune Magazine* and the *Institute of Public Opinion* are so important in a democracy.

What can be said in conclusion of this brief survey? In the first place it seems pretty certain that the era of a steadily rising standard of living is at an end. The frontier for expansion is ended, world markets are declining, and even the domestic market contracts with a stable population. Added to these restrictions we have borrowed heavily against future income. Thus any increase in national income may be offset by debt charges against it.

In the second place, the expected increases in direct taxes will leave less income of families and individuals free to be used to raise their standard of living. This leads to the question, What elements in the present standard of living may have to be cut in order to raise other elements regarded as more essential? Research on building costs indicates the probability that some reduction in absolute and relative expenditure on housing can be made without reducing housing standards. Although there are differences of opinion about this problem, it is also true that we do have many objective facts available. Housing expenditures run well over 30 per cent of the income for a large proportion of the population. Greater efficiency in production of materials and in building construction should reduce the cost to 20 per cent of family income for a large proportion of the population. All this can be done without sacrificing health standards in housing.[2,3,4,7,11] It seems likely that two changes must be made; (1) better organization and efficiency in the building industry; and (2) quantity production of standardized inter-changeable units for home construction. Quantity production and low unit cost may solve the housing problem as it has solved the automobile transportation problem.

If savings in family expenditure can be made from quantity production in housing, these small increments could be applied to meeting more adequately provisions for health and recreation. I mention recreation because of its importance to mental health. As to the maintenance of physical health, we observed that the average family in New York City paid out about $64 a year or 3.5 per cent of its income for medical care, for a family of three and one-third persons. Compared to this figure the Technical Committee on Medical Care reports the average cost for providing adequate medical care, if purchased on an individual basis at minimum fees, has been estimated at about $76 per person, or $310 a year for an average family.[12,13]

Obviously, such facts as we have, indicate that adequate health services can not be provided on an individual service basis for large masses of our population, any more than custom-built automobiles could be so provided. While it is true that the quantity produced Ford car lacks the refinements of a Rolls Royce, it is nevertheless a serviceable machine. Similarly, the quantity built house for family dwelling will lack some of the refinements of the second-hand house now passed down for occupancy to lower income groups, but it will be a new house! If we pursue the analogy it is evident that medical care for the masses if it is to be brought within their income must be on a quantity basis and at sacrifice of many of the niceties and refinements of present individual care at higher income groups. One reason why America is so far behind England in solving the Housing problem for families of low income is that England long since realized that low cost houses can be built only if the costs of expensive bathrooms, central heat and electric lights are saved. Consequently, these conveniences are eliminated. The houses are nevertheless sanitary and healthful. When America realizes that these conveniences prevent low cost housing it will be for public opinion to decide just what it wants. How far will public opinion accept a reduction in the standard of living in housing by sacrificing certain conveniences in order that income may be available for a more adequate form of medical care to preserve health?

Turning finally to the medical care problem we find that the Technical Committee estimates an over-all cost of services to be furnished through health insurance or analogous public medical services, or both, at about 2.6 billion dollars a year for a population of 130,000,000. Thus, the average cost would be about $20 a person or $80 to $100 per family. The quality of service at such rates would no doubt differ somewhat from the highest personal service standards for which the medical profession stands. This difference will probably be not so much in inferior service as in less individualized treatment. But even so it should result in large health gains to the masses. With limited total national wealth, limited markets for the sale of American goods, and a future national income already mortgaged to the repayment of large debts, we can not be choosers. A realistic approach to the total problem indicates the necessity of sober facing of the probable facts of a stable standard of living. Such changes in the future standard of living as may occur will probably be by way of re-distribution of emphasis upon its elements. We shall have to make economies on refinements and niceties of living in order to secure adequate provision for the more important element of health.

Will public opinion stand for such economies and redirection of individual and public expenditures? In my opinion, changes in medical care in the general direction of the recommendations of the Technical Committee are as inevitable as the trend to increased taxation at lower income levels. In making this judgment I rely in part upon certain facts of public opinion. These facts are drawn from the replies to the *Institute of Public Opinion* on certain health questions which newspapers have published but which are summarized in *Harpers Magazine* of October, 1938, page 551. "Do you favor the birth control movement?" Yes, 69 per cent in July, 1937. "Do you think that there should be free treatment for all venereal patients regardless of their circumstances?" Yes, 77 per cent in May, 1937. "Do you think Congress should appropriate money to aid States in fighting venereal disease?" Yes, 86 per cent in May, 1938. "Would you be willing to pay higher taxes for this purpose?" Yes, 69 per cent in May, 1938. "Do you think the government should be responsible for providing medical care for people who are unable to pay for it?" Yes, 81 per cent in June, 1938.

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MINNESOTA MEDICAL LEGISLATION*

J. A. A. BURNQUIST
Attorney General of Minnesota
Saint Paul, Minnesota

THE first legislation that I have found pertaining to the practice of medicine in Minnesota was enacted prior to the admission of the state into the Union. That was a measure passed in territorial days authorizing the formation of county medical societies. The theory was, I suppose, that those who could pass the examination required for entrance into such societies were qualified to practice medicine. The law, however, provided that nothing therein contained should prevent the practice of physic and surgery.

The use of the word "physic" reminds me of the doctor of that early period who in looking at the tombstones in the cemetery of his town said that considering the comparatively few buried there he felt that he had been quite successful, and added that throughout his entire medical career he had applied only three remedies: Bleed 'em, Puke 'em, and Physic 'em.

I don't know exactly how far I can go in calling the attention of doctors to jokes of this nature, for about thirty years ago in Saint Paul I told a doctor friend of mine that I had recently heard a new definition of appendicitis. He asked, "What is that?" I answered, "A modern pain costing about $200 more than the old fashioned stomach ache." As a result he gave me a rather heated and lengthy lecture on the subject of the appendix and appendicitis. So I wish to state at the outset of this discussion that if you encounter any further attempt on my part to spring a joke, I hope you will not take it too seriously.

Medical License Law

The first law passed by this state requiring the practitioners of medicine to be licensed was in the year 1869. That law, however, was repealed in the following year, 1870, but thirteen years later in 1883 a new license law was passed which provided that the faculty of the medical department of the state university should constitute the board of medical examiners. Four years later the law was amended so as to create a board of nine members to be appointed by the Governor, constituting the same number that the present law provides. In 1891 a statute was passed requiring that the unclaimed bodies of those dying in our state charitable institutions be distributed pro rata among the medical colleges of the state, same to be done in proportion to the number of students enrolled therein.

Naturopathic Law

During the time that I was a member of the state legislature and since, attempts have frequently been made to authorize the practice of healing by others than the regularly licensed physicians. I remember that in 1909 the so-called "naturopaths" tried to secure the passage of a law permitting them to practice. One of my constituents came to my home and, evidently knowing the influence of a wife over her husband, tried to induce Mrs. Burnquist to order me to vote for that measure. He also saw me about it personally. Not to appear too antagonistic, I said to him, "Before I promise to vote for a measure of that kind I'll have to hear the arguments on the subject. If I am convinced it's a good law, I'll vote for it. If on the other hand I find it's a bad measure, I'll have to vote against it." When the bill came up for discussion, a Dr. J. R. Phillips of Northfield, who was then a member of the legislature, called the attention of the members of the house in a most convincing address to the dangers of the enactment of the proposed measure. So, I voted against it.

A few days later I was riding home in the street car. The constituent who had wanted to practice "naturopathy" and had asked me to vote for the bill authorizing such practice saw me. He rushed to my seat to sit down beside me. Now, I said to myself, here is where I am going to be harshly criticized, but to my surprise he said, "You did the right thing in voting against that 'naturopathic bill.' We had raised three thousand dollars to get it passed, and before the vote was taken those engineering the bill came around to get more money. You did the right thing."

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*Part of Conference on Medical Problems at annual meeting of the Minnesota State Medical Association, Minneapolis, Minnesota, June 2, 1939.

Elevation of Professional Standards

It is my understanding that the State Medical Association has devoted much time and energy, especially during the past decade, to elevate the standards and requirements for the practice of medicine. Minnesota as a result is one of the leading states in the country in the matter of legislation of this nature. There are of course in your profession, as in the profession of which I am a member, some who are so conservative as to desire no change. There are undoubtedly others, as in all professions, who violate the ethical standards established by both law and custom. In this connection I am reminded of the debate between a prominent English physician and a prominent English lawyer as to the merits of their respective professions. In the heat of the argument the noted doctor said to the famous lawyer, "You must admit at least that the legal profession doesn't make angels out of men." "No," said the lawyer, "there is where you doctors are ahead of us."

Today, however, I think we will all gratefully admit that there are very few if any of our families in which one or more members thereof would not now be living if it had not been for the discoveries and the skill of the medical profession. We greatly appreciate the professional services that have been and are now being rendered by you, together with your activity in securing the enactment from time to time of higher medical requirements for the practice of medicine within our state.

The two most important statutes for the regulation of medical practice in Minnesota are the so-called Medical Act and the Basic Science law.

Illegal Practice of Medicine

The manner in which some of our people can be deceived through quacks and swindlers of every kind and description is remarkable. It is claimed that it costs this country through the expense of all of its law enforcing agencies and the loss of property and life through fraud and crime approximately fifteen billions of dollars annually. In speaking of pretenders to medical skill, I remember an incident in an action against one of them tried some years ago in the court house in the city of St. Paul. The defendant, who had become widely known as a healer and who resided at Somerset, Wisconsin, had been sued in Ramsey County for twenty-five thousand dollars by one of his patients because of an infection resulting from the application to his back of a plaster, the only remedy, as I understand it, that the alleged doctor ever applied. The health commissioner of St. Paul was on the witness stand. He was asked by the attorney for the plaintiff the following question: "Suppose," he said, "a man has stomach trouble and he consults the defendant, who applies to his back a plaster consisting of turpentine, aloes and other ingredients. Is that of any benefit to the stomach?" The doctor on the witness stand delayed his answer momentarily and then said, "Yes, I think it would be of some benefit. The patient's back would pain him so much that he would forget all about his stomach."

The enforcement of the Medical Act and the Basic Science law is left mostly to the Minnesota State Board of Medical Examiners. Their work has been strongly supported by the Minnesota State Medical Association. The Medical Board has not only been active against unlicensed quacks and swindlers but also against those in the medical profession who are alleged to have violated the law.

Minnesota Supreme Court Decision

The case of State vs. Oredson, 96 Minn. 509, in construing the Medical Act passed to prevent quackery of the nature I have described, said:

> "The act is a beneficial one, and is entitled to a reasonable construction. Its purpose was not, as the counsel for the defendant insists, to merely make prescribing for a fee the offense; so that the defendant could have practiced medicine generally, could have held himself out to the world as a physician and surgeon, could have examined patients, and inferentially could have operated upon them as a surgeon for pay, and yet would not have been guilty of a misdemeanor within the meaning of the act. On the contrary, its plain object was to prevent the public wrong of practicing medicine without a license. The act was not enacted for the benefit of any profession or of any school or theory of medicine. It was designed to secure the public in whole and in every part from quacks, humbugs, and charlatans masquerading under the venerable and honorable titles of surgeons, physicians, and doctors, and to protect the public in a just reliance upon the one using these titles as a man of proper education and sufficiently trained in the sciences involved. A just enforcement of that act would tend

to prevent the most deplorable swindling of the ignorant poor, who can least afford to pay for the luxury of deception, and who are most likely to be the dupes of ostensible practitioners, whose competency has not been determined by law, and whose moral deficiencies are evidenced by their false pretenses. The act is at once a statute of frauds and a health ordinance."

Care of Indigent

In these days when the government is granting relief to such a great extent, I shall briefly refer to the medical legislation affecting this situation.

Generally speaking, Minnesota has two plans or systems for the care of the indigent: the county system and the town system. Under the county plan one or more practicing doctors are to be appointed physicians of the poor and shall hold office during the pleasure of the board of county commissioners. If more than one be appointed, the order of appointment shall prescribe the district in which each shall act, and none shall be required to act outside of his district except in case of urgency. When directed by a member of the board or by the overseer, such physician shall attend upon and prescribe for any sick person in charge of the overseer, and also upon written direction of a member of the board shall attend upon and prescribe for any sick person who is entitled to receive support or relief from the county. If immediate treatment of any person who has been declared a county charge be required, any licensed physician who may prescribe for or treat him before the arrival of the county physician shall be paid therefor. He shall at once notify the county physician, who shall thereupon take charge of the case.

Under the town plan, the law provides for the furnishing of "medical attedance" to those entitled to the same at the expense of the taxpayers. Legal provision is made for the appointment of "a practicing physician to be physician of the poor" within the town.

County Welfare Board

While these laws have not been repealed, the Legislature in 1937 created in each county a County Welfare Board, and, except in Ramsey, Hennepin and St. Louis counties, provided that this Welfare Board "shall be charged with the duties of administration of all forms of public assistance and public welfare, both of children and adults. . . ."

In addition, the 1937 Special Session of the Minnesota Legislature in the bill appropriating $11,100,000 for relief provided as follows:

> "All counties shall permit free choice of vendor to relief clients for relief orders, provided that the vendors thus chosen conform to the regulations of the Executive Council and of the responsible relief agency."

Under the expression "free choice of vendor" there was some doubt as to whether a recipient of relief could select his own physician. The attorney general ruled in the affirmative, and in order to remove any doubt about the matter the 1939 Legislature, in the bill appropriating $8,750,000 for relief, provided that:

> "All recipients thereof shall be permitted free choice of vendor for services as well as supplies."

It is largely through the efforts of the Minnesota State Medical Association that this so-called free choice of family physician has been obtained and preserved. The appointment in each county of a contact committee of three physicians who serve without compensation and to whom the County Welfare Board can refer all complaints in respect to medical service has proved to be very successful.

Minnesota General Hospital

Prior to 1935 there existed considerable confusion over the question of whether the so-called University Hospital was the only hospital at which an indigent person could be hospitalized. This was due to the wording of the sections of our statutes which provided that said hospital "shall be primarily and principally designed for the care of legal residents of Minnesota who are afflicted with a malady, deformity, or ailment of a nature which can probably be remedied by hospital service and treatment and who are unable, financially, to secure such care. . . ."

This law resulted in many County Boards requiring all operative cases of that nature to be sent to the University Hospital instead of being cared for at some local hospital. It was the opinion of the Minnesota State Medical Association that the Legislature could not have intended that all indigent cases be hospitalized at one institution but rather had intended that the Minnesota General Hospital be considered as an adjunct of the University and primarily for the treatment of unusual cases, valuable from both a scientific and teaching point of view, as it was apparent that this one hospital could not possibly handle all such indigent cases from the entire state.

In 1935, therefore, the Legislature enacted a law authorizing the county board of any county to provide for the hospitalization of the indigent and afflicted residents of their county in the hospitals of their own communities or elsewhere within the State of Minnesota.

Court Decision on Care of Indigent

The Supreme Court of our state has written an opinion on the responsibility and liability of organized government to furnish and pay for medical care and hospitalization of an indigent person. In the case of Robbins vs. Town of Homer, 95 Minn. 201, the court said:

> "The county or town must provide for him as soon as may be. To decline this mandate of humanity and duty willfully by those upon whom it is imposed would subject such officials to prosecution for misconduct in office.
>
> "It is true that the obligations to provide for the poor are statutory. These, as we have indicated, are matters of regulation; but, where there can be no regulation from the very nature of the case, it must be that necessity will supersede the exercise of statutory authority, and immediate aid for the sick person should be furnished. . . .
>
> "It is true that ordinarily there must be a request from a person authorized to make the same to constitute a basis for contract liability, but there are some exceptions to this rule, as where a person lies under a moral and legal obligation to do an act, and another does it for him under such circumstances of urgent necessity that humanity and decency admit of no time for delay. Here the law will imply a promise to pay without proof that it has been made, when there was an expectation of reimbursement."

Occupational Diseases

The need of further statistics showing the influence of occupation upon disease and mortality was recognized in new legislation on this subject by the last legislature.

The Minnesota Workmen's Compensation Law has been in effect for many years. It was enacted to protect an injured workman in the event of an accident arising out of and in the course of his employment. This protection includes medical and hospital care as well as compensation for his time lost. Ordinarily, the term "accident" does not include illness or disease unless connected therewith. The Legislature has therefore, from time to time, made certain so-called "occupational diseases" compensable the same as though an accident had occurred. The idea has been to compensate a workman for an illness contracted on account of, or closely connected with, a particular type of work.

Physicians' Reports

At the recent session of the Legislature there was enacted a law providing for a study of individual cases to be reported to the State Department of Health by the members of the medical profession throughout the state. The new legal provision reads as follows:

> "Any physician having under his professional care any person whom he believes to be suffering from poisoning from lead, phosphorus, arsenic, brass, silica dust, carbon monoxide gas, wood alcohol or mercury or their compounds, or from anthrax or from compressed-air illness *or any other disease,* contracted as a result of the nature of the employment of such person, shall, within five days, mail to the state department of health a report, stating the name, address and occupation of such patient, the name, address and business of his employer, the nature of the disease and such other information as may reasonably be required by said department. The department shall prepare and furnish the physicians of this state suitable blanks for the reports herein required. No report made pursuant to the provisions of this section shall be admissible as evidence of the facts therein stated in any action at law or in any action under the workmen's compensation act. . . ."

Many physicians have had the experience of having spent much time and effort in treating a particular case and being under the impression that it was an "occupational disease" under the law, only to find out that it was not so listed, and then being unable to recover for their services. The purpose of the study is to determine a proper definition of the term "occupational diseases" and also to remedy certain conditions in industry that are conducive to their origin.

The value of such a study will of course depend to a large extent on the active service of the medical profession and the thorough manner in which the cases are examined and reported.

Psychopathic Personality Bill

Another law of interest to the medical profession passed at the last session of the Legislature is the act relating to persons alleged to have a psychopathic personality as therein defined. The county attorney, when satisfied a good cause exists, is to prepare a petition to be executed by a person having knowledge of the facts and present the same to the probate court. The court shall then appoint two duly authorized doctors to assist in the examination of the "patient." If he is found to have such psychopathic personality, he shall be committed to some suitable institution in accordance with the laws providing for commitment of insane persons.

A case involving the validity of the law is now pending in the Supreme Court. The relator seeks to prohibit the Probate Court of Ramsey County from proceeding in said action. The legal questions involve the constitutional right of the legislature to give jurisdiction of such a matter to the Probate Court, personal guaranties under the state and federal constitutions, the indefiniteness of the act and the inclusion therein of provisions not embraced in its title.

The examples above cited are but illustrative of the medical legislation heretofore and more recently enacted. From time to time new ideas have been and will be developed which may require further legislation. After all, there should be no limit to the coöperation between the government and the medical profession in the enactment of laws to prevent disease and to assist in the recovery of those who are ill.

The medical profession has already done much to prolong the average length of human life, especially through the reduction in infant mortality. Those of us, however, who have now passed the half-century mark are anxiously looking to the medical profession to discover some new method of renewing the cells of the human body so that we can live on indefinitely. To attain that goal, up to date alleged to be impossible, or other new discoveries in medical science, legislation may be of some assistance. It may help through governmental appropriations in the matter of research and in other ways, but it is mainly upon the courage, the self sacrifice, the work and the infinite patience of members of the medical profession that we shall be obliged to depend for the bringing about of additional prevention and cure of disease and the lengthening of human life.

Connected as I am with the office of Attorney General and its staff, which is charged with the duty of assistance in the enforcement of laws and in the giving of legal opinions to the State Medical and other boards, I wish to assure you that we desire at all times to coöperate with you in every way that we can. We are anxious to assist in the promotion of the best interests of the medical profession and to enforce the laws pertaining thereto as well as to help draft and advocate the enactment of any new medical legislation that will be of benefit to you and to the State as a whole.

PROFESSIONAL SERVICE AND THE PUBLIC TRUST*

HON. HENRIK SHIPSTEAD
United States Senator
Minneapolis, Minnesota

I AM deeply grateful to your officers for the honor of having the privilege of addressing you on this occasion.

Let me state in the beginning that your views on the question of medicine and public health are more important to this convention and the general public than anything I might say.

However, being in a position of responsibility where it may become my duty to deal with that subject in a legislative capacity, I take advantage of your hospitality to call to your attention certain phases of this very important subject.

First, let me express my firm conviction that the program of medicine and public health should be carefully studied and approved by the medical profession. Such program should be in the control of members of the medical profession rather than of laymen.

Attention has been focussed in the past two or three years on the health conditions of our people and the deficiencies which exist in the present system of providing medical care.

Public interest has to a large extent been stimulated by governmental, professional and other bodies, who, by means of widely-publicized studies, have endeavored to show the extent of disabling and preventable illness, and the medical facilities now available for the prevention and cure of disease.

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*Part of Conference on Medical Problems at annual meeting of the Minnesota State Medical Association, Minneapolis, Minnesota, June 2, 1939.

Results of some of these investigations have been open to question, for the health problem involves many factors which have too frequently been ignored.

In one respect there has been general agreement. Good medical care should be available to all of our people. That there are needs which have not been met is readily admitted.

A heated controversy, however, centers about methods by which existing deficiencies shall be corrected.

On the one hand there are those who take the position that the health of the people is the concern of the Federal Government, and that both preventive and curative medical care should be provided all of our population, except those most favorably situated, through official agencies and largely at public expense.

Opposed to this view is the equally positive group, among whom are the medical profession, who, while they agree that there is need for the expansion of the official public health services for the purpose of disease prevention and subsidized medical care for the indigent, are adamant in their belief that the Federal Government control in the field of curative medicine for the general population would result in regimentation and deterioration of the quality of medical service.

One thing is apparent in this controversy. That is that the health problem is not a purely medical one. As a matter of fact, it is just one phase of the maladjustment of our social and economic life.

This being true, we might well be concerned with the implications of such legislation as the Wagner Health Bill, which by its provisions tacitly admits that our present deplorable state of unemployment and consequent poverty must be regarded as something of a permanent nature.

Are we ready to admit this?

It is difficult to believe that the wealthiest nation on earth is ready to concede that it is unable to find a solution to its economic situation without resorting to regimentation of its people.

Here is a challenge which must be met if the American way of life is to be preserved.

In so far as the medical profession is concerned, it has performed a great service to the people of this country.

It is an accepted fact that the standards of medical practice in the United States are the highest in the world. The profession's generosity in caring for the sick unable to pay for services rendered deserves the highest commendation.

There has, however, been an apparent reluctance on the part of the medical profession to recognize that unusual times require unusual measures, and that under such conditions, experimentation in new methods of providing medical case is essential.

It is, of course, true that change is not synonymous with progress. On the other hand, there can be no justification for the position taken by some members of the profession that there is sanctity in status quo. It is heartening that this is being recognized by many medical organizations throughout the country.

Whatever methods are adopted to meet the health needs of the people, matters pertaining to medical practice should be under the control of physicians. Lay direction of physicians can result only in inferior service.

Although supporters of the Wagner Health Bill profess to agree with this view, no vast system of Government medicine can be inaugurated without control.

If this bill became a law, physicians would inevitably become subject to rules and regulations of federal and state bureaus.

If we are in agreement thus far, it is clear that a heavy responsibility rests upon the medical profession. Refusal to face the situation which now exists is not in accordance with the traditions of medicine.

In the field of science physicians are constantly experimenting with new methods. It is their obligation now to do likewise in their social and economic relations with the public, the Government and others with whom they have professional relations, without sacrificing those principles which are in the public interest.

We want to retain individual initiative and responsibility in medical practice. We want to preserve the traditional relationship between patient and physician. But we also desire that every person in this country, regardless of his financial status, receive the medical care he needs.

In my opinion, if Federal aid for the sick and needy is required, funds should be allocated among the states according to needs to be administered by the states and local subdivisions according to needs and should be administered by a physician.

Let me repeat that the present depression with its unemployment and widespread poverty has drawn attention to this problem of public health and medical needs of the people.

Accordingly, I believe that the demand for public control of medicine is based on the theory that widespread poverty and unemployment has become a permanent fact in this country.

With these premises I am not at at this time willing to agree. I believe that if we can get an honest agreement on what is a correct diagnosis of our social and economic ills, we can easily agree upon a remedy and restore this nation to economic social and political good health, so that the great majority of our population can again make their own living and pay for their medical treatment by being restored to a normal life and security.

THE DOCTOR AND HIS PATIENT*

GEORGE EARL, M.D.
Saint Paul, Minnesota

INCREASINGLY, there are conferences and interchanges of opinion between the various groups interested in the problem of health. This is evidenced by the character of today's program and the fact that we have representatives from the Public Health Service of the United States and Canada, a University Director of the Continuation Study, a member of the Catholic church representing the greatest voluntary hospital effort in our country, a member of the Department of Sociology of the University, the Attorney General of the State and a United States Senator.

Out of many different viewpoints should come a clearer conception, not only of what is apt to happen politically but (and this is more important) of what is actually best in the interest of the health of a nation.

The subject assigned to me, "The Doctor and His Patient," lays the emphasis upon the fact that health is, like every other important issue in life, a personal matter. Just as there are no two fingerprints alike or even no two blades of grass alike, so there are no two people whose requirements for health are alike. In this, as in other things, each person is unique, different and set aside from every other individual in the world. The truth of this is evident in the fact that there is no single straight line in nature. Straight lines are man-made—bricks, diagrams, units of measurement.

Both science and the personal equation are important in the relationship between the doctor and his patient and at this Conference I would choose, when I say doctor, to embrace not narrowly the M.D. alone. The dentist, the technician, the social service worker, are also engaged in the problem of health, whether their title is that of M.D. or some other.

It is the straight lines, figuratively speaking—that is, the science that man has developed, which has largely made our marvelous record in Minnesota possible. This scientific progress in medicine has taken place in the last hundred years and has been coincident with the other marvelous scientific development as typified by the advance made in transportation from the oxcart to the airplane. I think in the minds of all the problem is, how best to adapt these benefits of science to the uses of the doctor and his patient. We recognize that the crux of any difference of opinion lies in the methods of making available to the low income groups the benefits of scientific medicine. The wealthy have always been able to secure these benefits and even today in any type of government domination of medicine throughout the world, the people of wealth still have their choice of medical advisor.

For the indigent, or those unable to pay for medical care, the problem is more difficult. In Minnesota, at least, we doctors feel that the indigent should be well provided for, and furthermore, that freedom to choose his physician is an essential part of the personal freedom of the individual. I am sure that there is not one in this audience who does not regard free choice as the ideal arrangement and the arrangement which should be secured as far as possible for all.

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*President's address at the Conference on Medical Problems at the annual meeting of the Minnesota State Medical Association, Minneapolis, Minnesota, June 2, 1939.

It would seem that one difficulty in the care of the indigent is the problem of securing sufficient money from taxation to provide more adequate facilities and still keep the proper balance between the amount of money which should be assigned for the use of the knife, for drugs, for hospitalization, for strictly medical services and for the needs of life that are not strictly medical. To assume that all can be accomplished by the handing out of drugs or the use of the knife is thoroughly unscientific.

Surely, food, clothing, housing, and all the factors entering into human health and happiness also are necessary. To meet all these needs only a certain amount of tax money is available at any given time, and good judgment must be used in its proper distribution.

We think that Minnesota has taken a lead in its attack on the general problem of health. We submit as evidence the results already accomplished. The United States leads all the countries in the world, according to international health records, in the control of infectious diseases, and in the reduction of infant and maternal mortality. Minnesota is in the top rank among the states of the union, judged by every possible health measurement.

In Minnesota, the first health worker was probably some mother or neighbor. But the doctors soon came and the midwives and nurses. After them came the hosiptals and, it is interesting to note that the first hospital, St. Joseph's, established in St. Paul in the 1850's, was voluntary and that it preceded the tax-supported institutions by a couple of decades. The second hospital, St. Luke's, was another voluntary effort.

Private medical schools were established in both St. Paul and Minneapolis, later combining to form the nucleus of our present great University Medical School. Note the first efforts at medical education were privately supported, not tax-supported. Standards developed, legislation regulating such standards and the practice of medicine came into existence, and today, with the Medical Licensure Act, the Basic Science Law, with the educational standards required, Minnesota is justly proud of her achievement.

Our Public Health officers, the local and state boards of health in Minnesota, have had a large share in Minnesota 's marvelous progress. The State Board of Health with its extended activities is making available to the doctor and his patient the benefits of modern scientific research in preventing disease. Its aid in the diagnosis and treatment of syphilis and pneumonia should be mentioned as examples of the extension of public health activity and of the unusual degree of coöperation existing between the government officials and the practicing profession here.

We have, in Minnesota, a large number of tax-supported institutions for the mentally deficient, and also a large number of tax-supported institutions, not only for the indigent, but for care of chronic diseases requiring hospitalization and care beyond the reach of the low or even the average income group. It is interesting to note that it was the practicing medical profession which first suggested and aided in the development of these tax-supported institutions. Our state institution for crippled children provides an instance. It was a private practitioner who planned the hospital and appealed to the legislature for funds. The practicing physicians believe in the proper care of the indigent and of the low income group.

The availability of medical care for the low income group has been the crux of the Conference today. If State Medicine were to be adopted for the low income group, leaving out the actual indigent, it would affect the majority of the people of Minnesota, the people who, through direct and more largely through indirect taxation, would have to face the burden of increased government spending.

It is estimated that if State Medicine were to be made available on this scale the gross taxes paid in the State of Minnesota would have to be doubled over the present rate. This is an estimate, of course, not a statement of fact. At any rate, it is agreed that to institute such a procedure would mean an increased burden. Only the future could tell the ultimate size of that burden.

This matter of taxes is a very important thing, especially when we remember that by establishing State Medicine we would only provide for medical care. The question arises as to what advantage would come if housing, food, clothing, and all of the other basic factors were neglected. The old adage is true that for every advantage there is bound to be some corresponding disadvantage. Often the best progress comes from more slowly evolving change, an evolution that will not upset basically the system that has placed Minnesota, with a proper balance of state and private practice, in the top ranks of all the states in the Union.

State Medicine is not synonomous with democracy as we understand it in this country. It was developed first in countries that were neither liberal nor democratic in our sense. Some of them are now most definitely undemocratic. History records the rise and fall of many civilizations and it is interesting to note that at the time of the decadence of each, governments were taking an ever increasing part as compared with voluntary effort.

All of us could produce some arguments for complete state dispensation of medical care making it available without cost to the entire nation. Individual instances where a mother would not have been neglected and where a child's life would have been saved undoubtedly occur and they have an emotional appeal. We must not, however, allow isolated instances to rob us of reasonable thinking upon the question at issue.

We believe that there is available to the people of Minnesota, through our tax-supported institutions, through our public health service, state and local, through our University, and through our practicing physicians and their professional allies, including the hospitals, reasonably adequate medical care and as compared with other vital factors influencing the health and happiness of the people of the state, we believe that medical care is more adequate in proportion than are those other factors.

We believe that the public of Minnesota still wants, on the whole, free choice of medical care. We believe that in Minnesota we have a proper balance between the tax-supported medical care and voluntary effort. We know we have a fine spirit of coöperation between the University, the State Board of Health, the State institutions and their managements on the one hand and the practicing physicians, on the other. Increasingly, this coöperation is placing in the hands of the doctor of the patient's choice, facilities to keep up with the march of progress and to maintain Minnesota in her present point of leadership.

There is one phase of development that the practicing profession of Minnesota is studying in behalf of the patients: that is the question of insurance. Insurance for hospital and medical care is attracting a justly deserved interest. The patient already recognizes the need for insurance against fire, accident, life and to some degree against illness. We are essentially a nation of premium payers and instalment buyers to such an extent that a major illness often leaves the low income group without funds for the care of the always unexpected and often sudden illness. By taking just a little out of the monthly income to take care of a premium, the same as is done for other emergencies of life, it may be possible for people to insure themselves against sickness on a voluntary basis just as they do for other emergencies. It may be that for low income groups and even for average income groups, adequate medical care can be made available in our state on sensible, business-like prepayment plans on the same principle that people buy a home and provide for other types of insurance.

Hospital insurance in various forms is well underway. The problem of insurance for medical care is more difficult because, as we have stressed repeatedly, of the personal equation. Experiments are being tried by the profession in many other localities. So far, we have been observing and studying these experiments.

What is the proper balance between tax-supported medical care and voluntary medical care? We believe that, as far as possible, voluntary efforts should be encouraged and that the tax-supported activities should supplement them so as to make available increased aids which the doctor of the patient's choice can render, realizing the reasonable limitations involved. We believe the continuance of private initiative and control of all activities is fundamental, and that the state should assist rather than dominate the various fields of life.

Judging from the progress of history, we question whether the state should assume a totalitarian attitude toward the protection of health. If government gets control of business and the professions, history indicates that it is apt to step up to the control of our personal life, and even of our religious beliefs. Immediate advantages often have an emotional appeal and result in changes that in the end are not in the best interests even of the contemporary generation. If, in the past, in the rise and fall of ancient and modern civilizations, it has often been voluntary effort which has introduced sound legislation, good health care, real business progress, moral and religious advancement, is it not of prime importance that these voluntary efforts continue to be encouraged and that we do not lose sight of a proper balance between voluntary and governmental activities? In spite of economic depression and unusual world conditions, Minnesota, where that balance has been good, has a most enviable position.

◆ CASE REPORTS ◆

LARGE OVARIAN CYST

O. A. OLSON, M.D.

Minneapolis, Minnesota

OVARIAN cysts are the most common tumors within the pelvis. As a rule they do not develop papillary growths and do not become malignant. They are thought to develop out of the fetal remnants of the Wolffian ducts. As stated by Goodall, "The study of comparative and human embryology has shown that the female of the species is a rung higher than the male in the developmental ladder." During early fetal development the ovary is a replica of the testicle and at a certain age the two are undistinguishable. The more highly organized and differentiated a tissue becomes, the more apt it is to contain fetal remnants of unabsorbed structures. The more highly developed ovary contains the remains of the developmental stages through which it has passed in its embryonic growth, following the law that what is fixed in the lower species becomes transitory in the higher. The human ovary, in addition to the tumor potentiality of its own, has the additional risk that anything of testicular origin that remains in the ovary as functionless tissue, may be awakened into tumor formation after years of latency by process of nutritional changes.

Paraovarian cysts usually occur in middle life. Many of them rupture spontaneously and are absorbed while others continue to grow and often give rise to interabdominal emergencies, such as toxemia, shock due to torsion of the pedicle and hemorrhage.

Case Report

Mrs. B. K. for many years had noticed that her abdomen was large. During the past six years it seemed to enlarge more rapidly and an umbilical hernia developed which she thinks was due to coughing. One year ago she was examined by a physician and told that she had a tumor. She then weighed 170 pounds. This tumor continued to grow until it was difficult for her to walk and she had severe backache when in bed.

She was fifty-two years of age, married, and upon admittance to the hospital on April 16, 1939, was well nourished and weighed 200 pounds. She had never been pregnant. Laboratory examinations were negative. Blood pressure was 110/80; Wassermann negative; heart and lungs negative. She had a very large cystic tumor, which due to its size, caused her a great deal of abdominal distress (Figures 1 and 2).

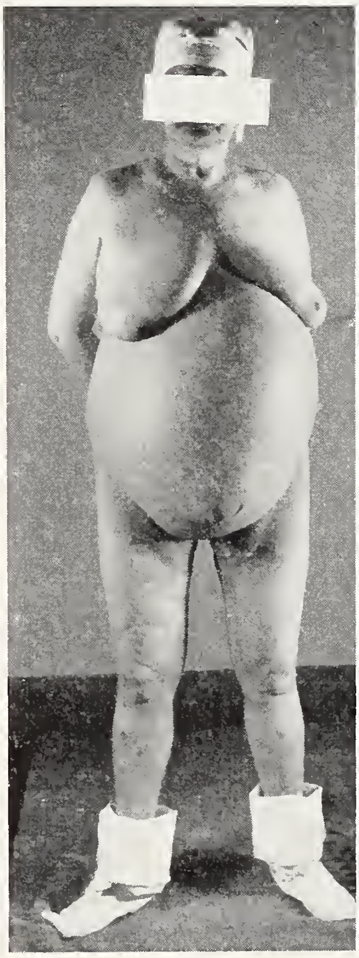
Fig. 1.

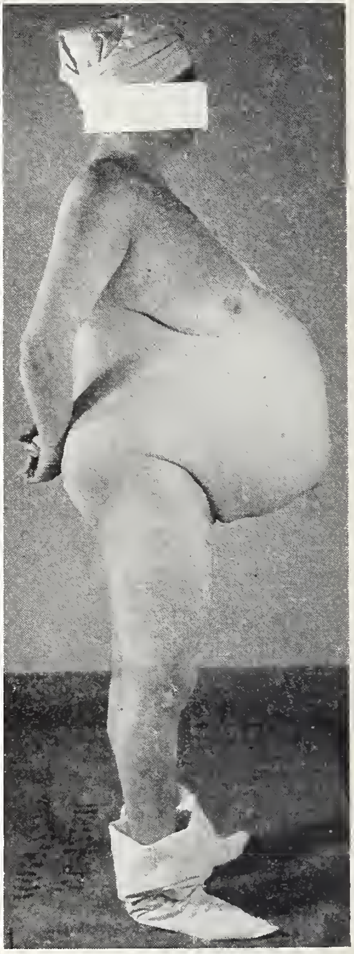
Fig. 2.

She was operated on April 17, 1939, under combined local and gas anesthesia. An incision extending from the umbilicus to the pubis was made under local infiltration and several gallons of chocolate-colored fluid were aspirated. The collapsed cyst was attached to the left broad ligament by a pedicle as large as one's wrist. The pedicle was ligated, the collapsed cyst delivered without difficulty, and the abdomen was closed in layers. She did not suffer shock. After three or four days she developed paresis of the bowels. With the use of nasal suction, high enemas and a tight bandage to compress the abdomen, she made a good recovery and left the hospital May 6, 1939. The tumor removed and its contents weighed forty-eight pounds.

Pathological report: Macroscopic: Ovarian cyst, filled with reddish-brown fluid. No hard masses. Microscopic: Sections of portions of cyst wall show no irregularity of the epithelium.

Microscopic diagnosis: Multiocular cyst.

This case is of interest, not because it presents anything new, but because of the enormous size of the cyst. In these times, a person living in a large city in the midst of highly organized governmental uplift must have considerable ingenuity to be able to escape medical attention for so long a time.

BILIARY OBSTRUCTION IN THE NEWBORN WITH RECOVERY*

ROBERT H. ALWAY, M.D., and ERLING S. PLATOU, M.D.
Minneapolis, Minnesota

CASES of biliary obstruction in the newborn have been reported since 1891. John Thompson of Edinburgh, in 1892, presented a complete summary of the cases thus far reported, bringing the total number to fifty. In 1901, Rolleston and Hayne reported ten more cases and in 1911, Howard and Wollbach presented fourteen additional cases of congenital biliary obstruction. W. E. Ladd, in 1928, reported a series of forty-five patients, on fifteen of whom he had operated. Nine of the fifteen survived. All of the thirty unoperated patients died as a result of the biliary obstruction. Those who have reported cases of congenital biliary obstruction state that without surgical intervention there is 100 per cent mortality. The case which we report is that of an infant whom we believe had a complete biliary obstruction and who is living and well now at his present age of eleven months.

W. McC., male, ten weeks old, was admitted to the hospital July 25, 1938, because of jaundice and failure to gain weight. He was born three weeks prematurely following the normal first pregnancy of a thirty-two year old mother. Both parents are healthy and have negative serology. There was no history of jaundice in infancy in either family. The birth weight was five pounds and thirteen ounces. The placenta, vernix and general physical examination were reported normal, but on the second day after birth jaundice was noted in the infant. This became progressively more intense and shortly before admission assumed a deep greenish hue. Birth weight was not regained for five weeks and at ten weeks the infant's weight was seven pounds and twelve ounces. The stools, which were passed three to four times daily, were described as having been "greasy and almost white" since birth. The urine was said to be dark yellow and "foamy." During the first five weeks he was breast fed; for the next two weeks he received one-half to two-thirds raw milk and dextri-maltose and thereafter evaporated milk and Karo. In the week prior to admission the infant became listless, had frequent emeses and often refused its feedings. Tremor of the arms and legs was noticed prior to admission but at no time was any temperature elevation discovered.

When admitted to the hospital the baby appeared greenish yellow in color, had a marked loss of muscle turgor and moderate dehydration. The deeply icteric skin presented no petechiæ, purpura or other lesions. The eyes were expressionless, with deeply stained scleræ. The nose, throat, ears, heart and lungs were found normal. The liver was enlarged and firm, the edge being 4 cm. below the costal margin in the midclavicular line. The spleen was palpable but not large. Neurologically there was nothing abnormal noted. The striking physical signs were the jaundice and the athrepsia. The stools were acholic and the urine stained the diaper a deep brownish yellow. The temperature was normal and cultures of blood and urine were sterile. No evidence of infection could be found.

On admission the hemoglobin was 60 per cent, leukocyte count 12,000, with a differential of: neutrophils 34 per cent, lymphocytes 63 per cent, monocytes 2 per cent, basophil 1 per cent. The reticulocyte count was 1 per cent. Erythrocyte fragility was normal. No erythroblastosis was found at the time of admission or in subsequent examinations. The bleeding time was four minutes and clothing time four minutes and thirty seconds. Icterus index was 52 and the van den Bergh reaction was prompt direct. On two occasions a four day stool specimen showed no bile pigment. Microscopic examination of the stool with fat stain showed the greater portion to be fat globules. Urinalyses were negative except for the presence of urobilin. Both Mantoux and Wassermann tests were negative.

During the seventy-eight day period of hospitalization the infant had several attacks of fever and diarrhea and was almost moribund at times. The infant had alternate periods of deep jaundice, during which the stools were moderately firm, and periods of severe diarrhea with slightly less jaundice. The treatment was principally dietary. The diet consisted of low fat or fat-free milk with calcium caseinate plus large doses of synthetic vitamins. Apple powder, when added to the formula, was strikingly effective in controlling the diarrhea. Five transfusions of about 50 c.c. each were given and intravenous glucose and parenteral fluids were administered as indicated. Several times during the hospital course surgical intervention was considered, but the infant's condition positively denied us such a risk. Toward the latter part of his hospitalization the dietary problem abated somewhat and banana and cereal were tolerated. About this time the jaundice lessened in degree, the stools became yellow and a four day stool specimen showed an average of 700 mgm. of urobilinogen per day. The infant was discharged on September 10, 1938, weighing eleven pounds and fourteen ounces. The jaundice had disappeared almost completely, feedings were tolerated well and the diarrhea cleared up.

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*Read at monthly meeting, Abbott Hospital, Minneapolis, Minnesota, April 1, 1939.

Inasmuch as congenital obstruction or obliteration of the biliary tract is a relatively rare condition it is necessary to first rule out the usual causes of jaundice in infants. Those especially considered were icterus neonatorum, congenital syphilis, erythroblastosis fetalis or icterus gravis, icterus associated with hemolytic sepsis and acute catarrhal jaundice.

Congenital syphilis may be ruled out by the Wassermann reaction and radiographs of the long bones. Also, after four to six weeks the chance of error is not great.

Icterus resulting from hemolytic sepsis may be associated with an enlargement of the liver but is not usually accompanied by biliuria, acholic stools, a progressively increasing jaundice and high icterus index.

Erythroblastosis fetalis simulates the clinical picture of biliary obstruction. The jaundice is of like intensity and in addition to hepatomegaly there is usually a definite enlargement of the spleen. In these cases a golden vernix caseosa and an hypertrophied placenta are frequently noted at the time of delivery. The van den Bergh reaction is usually biphasic. The principle diagnostic feature is the presence of an increased number of erythroblasts on successive blood examinations. Erythroblastosis fetalis has a very high mortality in the first few days or weeks of life, consequently its differentiation from biliary malformations becomes easier with the passage of time.

In his previously mentioned study of forty-five cases of congenital obstruction of the bile ducts, Ladd states that the malformation may vary widely both in type and degree. There may be no extra-hepatic ducts. There may be atresia of the hepatic ducts or the common duct. Partially biliary obstruction follows stenosis with narrowing of the common bile duct. Complete obstruction may result from the plugging of a stenosed common duct with inspissated bile.

Ladd gives the following clinical picture, findings and course. Jaundice may be present shortly after birth but is usually not marked until the second or third week. It becomes more intense in the second month. The color of the skin is greenish-yellow rather than the marked yellow as seen in biliary obstruction in adults. The stools are acholic as a rule, but may at times give a positive test for bile or show gross evidence of bile because the bilirubinemia produces staining of the intestinal mucosa. The urine is dark and gives a positive test for bile. The icterus index usually ranges from 50 to 200, varying from day to day and patient to patient. There is no erythroblastosis and the erythrocyte fragility is not abnormal. The striking features are the general icterus and the enlarged, firm-edged liver.

When the diagnosis is established, surgery is indicated, for 100 per cent mortality is to be expected, usually within four and one-half months. The exception to this is in the passage of a plug of inspissated bile in a case with stenosis but without atresia.

On the basis of the picture of complete biliary obstruction, the long duration of the jaundice, absence of signs of syphilis, no signs of hemolytic sepsis and negative family history, we concluded that this was probably a case of congenital biliary obstruction. In view of the favorable outcome of this case we present it as a probable congenital biliary obstruction, resulting from plugging of a stenosed common bile duct with inspissated bile.

SUBUNGUAL GLOMUS TUMOR

SELMA C. MUELLER, M.D.
Duluth, Minnesota

WITHIN the past ten years, various authors[1,2,3,4] have been reporting small series of cases and isolated cases of so-called glomus tumor, originally described by Masson[5] in the French literature in 1924 under the name of "arterial angio-neuromyoma." He also used the term "glomus tumor" because of the similarity of these tumors to the glomus coccygeum of Luschka. I have found no report of this type of case from Minnesota and therefore wish to briefly report a case from Duluth.

The patient was a woman sixty-six years of age complaining of a very sore finger, present for the past year. The base of the nail of the left ring finger had been very sensitive, almost incapacitating her at times. Otherwise she felt well and was normally very active.

Examination revealed a purplish elevation at the base of the nail of the left ring finger, involving the skin, cuticle, and base of the nail. The swelling was in the midline, purplish in color, and felt fluctuant, giving the impression of retained fluid. The nail itself was eroded over this area and the distal portion of the nail was irregular and ridged. There was much pain on pressure over the swelling which was approximately 5 mm. in diameter.

My first impression was that this was a chronic granulomatous infection, with abscess formation. Under local anesthesia, the swelling was incised; no pus or serum escaped, but there was profuse bleeding. After a week of observation and conservative treatment, including x-ray therapy and wet dressings, the apparently fluctuant mass had not diminished in size. Therefore, it was deemed best to perform a biopsy. Under nitrous-oxide anesthesia it was found that the affected area could be cleanly peeled out of its situation, leaving a smooth clean cavity about 5 mm. in diameter. This was packed with iodoform gauze and subsequently healed completely. The tumor consisted of a soft, friable, vascular tissue. It was sent to Dr. Wells, pathologist at St. Luke's Hospital, who made a diagnosis of "glomus tumor" from the microscopic sections.

Masson,[5] in 1924, first described peculiar small subungual tumors which he believed were related to arterio-venous anastomoses. Because of their resemblance to the gland of Luschka, or the glomus coccygeum, he called these tumors "glomic tumors"; also "arterial angio-neuro-myomas." It is probable that these tumors arise from the arterio-venous anastomoses normally found in the fingers and toes, nail beds, thenar and hypothenar eminences and soles of the feet. These structures have been beautifully described and presented in detail by Popoff.[6] According to him, they arise from the preterminal subcutaneous arteries, and have a complicated structure and probably an important function in heat regulation of the extremities and of the entire body.

The glomus tumors are usually small (less than 1 cm. in diameter), and most frequently located in the subungual region, but are also found in the finger pads,

(Continued on page 723)

HISTORY OF MEDICINE IN RAMSEY COUNTY

BY J. M. ARMSTRONG, M.D.

(Continued from September issue)

BIOGRAPHIES

Thomas Chatterton Schell

Dr. Thomas C. Schell was an Englishman by birth, having been born in the Isle of Wight in 1823. He studied medicine with Dr. W. W. Mathews as preceptor at Rochester, New York, and practiced there for four years, then at Detroit, Michigan, and later at Genesco, New York, for four years. He then received an appointment to the Marine Hospital, Sandwich Islands, where he remained two years. He practiced for a brief period thereafter in Lockport and New York City. In 1859, he came to Saint Paul. On his arrival he looked the field over carefully and found the regular physicians were well established and able men, while the homeopathic physicians were rather a poor lot. Being an opportunist he announced himself a convert to homeopathy and was received by that cult with open arms. The regular profession twitted him for his duplicity, to which he replied that what was good for his pocketbook was good for his patients.

Doctor Schell was not a man of great ability, but soon established a large practice. He was very fond of the good things of life. He got drunk regularly every day at one o'clock and told his patients so, advising them to call him in the morning as he could not make calls in the afternoon. He died in Saint Paul in 1883. His wife, whom he married in Saint Paul, survived him many years and resided in Saint Paul till the time of her death.

Charles Eastwick Smith

Dr. C. E. Smith was born at Blossburg, Pennsylvania, on February 14, 1843, and received his medical education at the University of Pennsylvania as did his father and son. He came to Saint Paul with his parents in 1855 and graduated in medicine in 1865. As a student, he went to Gettysburg and was appointed acting assistant surgeon in the army. He told the writer that he saw and did enough surgery during those few days to last him the rest of his life. At different times, he was city and county physician and deputy coroner. He also taught in the Saint Paul School for Medical Instruction, the Saint Paul Medical School and the College of Physicians and Surgeons, of Minneapolis, and was one of the medical faculty of the University of Minnesota when that body was an examining board only.

Doctor Smith was a quiet undemonstrative man with a good mind and education, skillful in diagnosis and treatment. He retired from practice in 1911 and was an invalid during his last years. He died in Saint Paul, January 10, 1928.

The Smiths, father, son and grandson, had their office on the corner of Fourth and Market Streets for fifty-six years. In 1872, Dr. F. R. Smith built a small brick building on the corner for an office and it was occupied till 1911 when Dr. C. E. Smith retired from practice.

E. Herman Smith

Dr. E. Herman Smith died at his home in New Canaan, Connecticut, in the twenty-ninth year of his age, in 1871, of pulmonary tuberculosis. He was a graduate of the College of Physicians and Surgeons of New York and following his graduation was interne at Bellevue Hospital. He came to Saint Paul in 1868 in the hope that the climate would benefit him. He was the first member of the Ramsey County Medical Society to pass away. Being a young man and in wretched health he did not acquire a large practice nor was he capable of attending to one. His ability, however, was recognized by the profession as above the average and his personality was such that he made firm friends. He was one of the founders of the Ramsey County Society and was made secretary of the State Association at the time of its organization in 1869.

Franklin Rushton Smith

Dr. Franklin R. Smith, son of Charles Eastwick Smith and Mary Ogden, was born on his father's farm near Burlington, New Jersey, on February 19, 1809. The family home, however, was on New Street, Philadelphia. Charles Eastwick Smith was a druggist and raised castor plants on his farm, making cold pressed castor oil from the beans and is said to have been the first in the country to do so. John Wyeth was an apprentice in his apothecary shop in Philadelphia and later bought the business and today the outcome of that venture is John Wyeth and Sons.

F. R. Smith was a graduate of the Philadelphia School of Pharmacy and before graduation was apprenticed to an apothecary as was the custom at that time, and later was assistant to George B. Wood, Professor of Pharmacy at the University of Pennsylvania. He was also apothecary to the Pennsylvania Hospital in 1829-1831. He graduated in medicine at the University of Pennsylvania in 1838 and the same year married Mary Guest. He practiced first at Blossburg, Tioga County, Pennsylvania, and in 1844 moved to Bellefont, but finding country practice there too arduous because of the mountains, went to Easton, Pennsylvania. He came to Saint Paul in 1855 and began practice at Fourth and Market Streets. He retired from practice in 1879 and died at Ft. Adams, Rhode Island, on August 5, 1892, while visiting his eldest son.

Franklin R. Smith was a Quaker, as was his wife, the latter always adhering to the Quaker manner of dress. Doctor Smith did not intend to practice medicine in Saint Paul on his arrival, but could not remain idle and it was fortunate he began when he did as the panic of 1857 destroyed all his savings, and for some years after that the struggle for existence for him and his family was a strenuous one. He was probably in his time the most respected physician in Saint Paul. His fellow practitioners honored him for his sound advice, honesty and straightforwardness. Doctor Flagg said he was the salt of the earth and the best obstetrician of his period in Saint Paul. He was the father of Dr. Charles Eastwick Smith who graduated from the University of Pennsylvania in 1865, and grandfather of Charles Eastwick Smith, who graduated in 1908.

John Steele

Dr. John Steele came to Saint Paul in 1855 from Strasburgh, Pennsylvania, where he had practiced medicine since 1831, the year he received his degree from Jefferson Medical College. He was born in Chester County, Pennsylvania, in 1809, and died in Saint Paul, December 11, 1885. Dr. Steele retired from the practice of medicine about 1882. He had devoted much of the latter years of his life in caring for his business ventures and was prominently identified with the growth and development of the city. He was a member of the City Council from 1861 to 1865 and again from 1869 to 1872. Doctor Steele was treasurer of the Saint Paul Academy of Medicine and Surgery during the life of that society, and one of the original members of the Ramsey County Medical Society. Doctors Steele, Potts, and Brisbine were considerably older than their contemporaries, and were looked upon by the younger men as somewhat old-fashioned practitioners. Doctor Steele was a brother of Franklin Steele, one of the early settlers of this territory. Dr. John Steele Abbott of Saint Paul is his grandson.

Jacob Henry Stewart

Dr. J. H. Stewart came to Saint Paul in 1855, a slender, auburn haired, young man and almost immediately became popular with all classes. He made friends readily and had a pleasant word for everybody. These qualities were of great value to him professionally and in politics to which he devoted rather more energy than to his profession, though he had a large practice.

Doctor Stewart's first offices were that of president of the newly organized Y.M.C.A. in 1856-1857 and county physician in 1856-1857. He also was Senator in the Second State Legislature 1859-1860,and Surgeon-General of the state, 1857-1863. In 1861, when the First Minnesota Infantry was organized, Doctor Stewart was commissioned Surgeon on April 29, and went to the front with that regiment. He, with Doctor Le Boutilliere, remained on the field to care for the wounded after the rout of Bull Run, and were taken prisoners but allowed to retain their side arms by General Beauregard. Later, both were paroled and assigned to a skeleton regiment. Doctor Stewart saw no more active service.

In 1864, he was elected Mayor of Saint Paul and the following year was appointed Postmaster, holding that position for five years. In 1869, he was again elected Mayor and reëlected in 1871 and 1873. From 1877 to 1879, he was Representative in Congress from this district. From 1880 to 1884, the firm of Stewart and Wheaton (C.A.) held the office of city physician. Doctor Stewart was born in Clermont, New York, January 15, 1829, and died in Saint Paul, August 25, 1884. He graduated in medicine in 1851 from the University Medical College of New York, and practiced in Peekskill on the Hudson before coming to Saint Paul. The late Dr. Jay Stewart was his son.

Alexander Johnston Stone

Dr. Alexander J. Stone was born in Augusta, Maine, September 7, 1845, and died in Saint Paul, July 16, 1910. He received his medical degree from Berkshire Medical College in 1867, and after some time studying abroad became assistant to Dr. Horatio R. Storer of Boston. In 1868, he located in Stillwater and in 1870 came to Saint Paul. Doctor Stone was a gifted man in many respects, a skillful operator, widely informed, and had an unusually happy facility of expressing his ideas on professional, social and political subjects. Kindness, charity and social graces were all his—a gentleman by instinct and by inheritance. The writer does not feel that he is equal to the task of eulogizing this gifted man. It was a pleasure to know him.

The profession is indebted to Doctor Stone for the beginning of medical education and journalism in this state. He served as president of the State Medical Association, of the Association of Medical Editors, of the Association of Military Surgeons, and was vice president of the American Medical Association. At the time of his death he was Surgeon General of the state. In 1887, the Iowa State University conferred upon him the degree of Doctor of Laws. He served Saint Paul as Commissioner of Health and established at that time the bacteriological laboratory of the department. He also served on the State Board of Health. He was the first physician in Saint Paul and one of the first in the country to specialize in gynecology. It has been said that Doctor Stone did not know the value of money but did know a good horse. He had a Dupuytren's contraction of the fingers of both hands and congenital dislocation of both hips, which last he concealed by always wearing a frock coat. This deformity gave him a very slow and dignified gait.

William Wilson Sweney

Dr. William W. Sweney was born at Milton, Northumberland County, Pennsylvania, December 18, 1818. The family moved to Illinois in 1836, and, in 1844, he with his father and brothers published the *Galena Sentinal.* In 1847, he commenced the study of medicine with Dr. A. B. Hull of Marietta, Illinois. Dr. J. H. Murphy was a fellow student in the same office. After three years of study he came to Saint Paul for his health and stayed there till he left to attend Rush Medical College where he received his diploma in 1851. In 1852, he moved to Red Wing where he lived to the time of his death, August 12, 1882.

Doctor Sweney was president of the State Medical Association in 1873. Several papers by him may be found in the *Northwestern Medical and Surgical Journal,* and in the early reports of the State Board of Health, and are of considerable interest. He was a member of the State Legislature (session of 1858) and for many years a member of the Red Wing City Council. He was much interested in the archeology of the Red Wing region. Most of his professional life being passed in Red Wing, his biography properly belongs to the history of that city.

Joseph A. Vervais

Dr. Joseph Vervais was born at Terrebonne, Quebec, on May 22, 1822, attended McGill but received his medical degree at Geneva Medical School in Geneva, New York, in 1843. He returned to Canada where he practiced and held the office of coroner for ten years. He came to Saint Paul in 1856. In 1859, he was city physician and health officer. He was commissioned Assistant Surgeon, Fifth Minnesota Infantry, September 3, 1862, and resigned April 3, 1863. In January, 1864, he again entered the service as surgeon of the Second Cavalry and was discharged November 5, 1864.

Doctor Vervais acquired quite an extensive practice particularly among the French Canadian residents. While not associating much with the other physicians of Saint Paul he was known and respected by them. His professional card in the papers and directories of the sixties notified the public that he was prepared to do eye surgery. He was a gentleman, rather tall and slender, and attended to his own business. He died October 10, 1868, in Saint Paul.

Samuel Willey

Dr. Samuel Willey was born in Boston, Massachusetts. At the time of his father's death, when he was about seven years of age, the family moved to Cleveland, Ohio. He attended Yale College and graduated at the Cleveland Medical College in 1850. Immediately after graduation, he received the appointment of Junior Assistant Physician at the Ohio Hospital for the Insane at Columbus, shortly becoming Senior Assistant, and remained there until he came to Saint Paul in October, 1852 (with the exception of a short time in Cincinnati). It is said he arrived with but fifty cents in his pocket, and got his first patient while debarking from the boat; a man who fell and broke his leg. Almost immediately he became associated with Dr. A. G. Brisbine. His coming to Saint Paul was perhaps largely influenced by the condition of his health.

Doctor Willey was a small man, well groomed, and somewhat vain, agreeable in manner, conversation, and appearance. His attractive manners made him a great favorite, especially with women, of whose society he was rather fond. Perhaps no physician in Saint Paul has since enjoyed so much popularity. He was also popular with his brother practitioners and though he had some enemies, his ability was not doubted. He was elected president of the State Medical Association at its reorganization in 1869, and as the founding and success of that society was largely due to his efforts, he was reëlected the following year and the same year was elected vice president of the American Medical Association. It is also said he was the leading spirit in the Saint Paul Academy of Medicine and Surgery established in 1860. In his later years, his practice was largely confined to consultations, drawing patients from all over the Northwest.

In 1857, Doctor Willey attempted to give up the practice of medicine because of his health and the large amount of work thrust upon him, but found he could not stand the enforced idleness. Having so much work to perform, he found it necessary to systematize his activities and introduced practices which, though ordinary today, were innovations in Saint Paul at that time. He was the first physician in Saint Paul to stop compounding his own prescriptions, the first to establish regular office hours, and the first to employ a collector to attend to his overdue accounts. In May, 1871, he gave up practice and moved to Bayfield, Wisconsin, in an effort to regain his health but was too far spent to recover. He died November 21, 1872, of pulmonary tuberculosis, at the age of forty-four years, optimistic till the last that he would recover and convinced that his medical career and usefulness had only just begun. His portrait with a biographic obituary may be found in the January, 1873, number of the *Northwestern Medical and Surgical Journal.*

Were he living today, Doctor Willey would, no doubt, have organized and been at the head of a large clinic as he had executive talent and was a diplomat. He was well read in many subjects and had the most extensive and varied medical library in Saint Paul. He married in Saint Paul in 1855 and his widow, later Mrs. Mary A. Fuller, died but a few years ago. His only child, a son, is also deceased.

During his last years he was much addicted to drink and was a user of narcotics. He had always consumed a large amount of chewing tobacco. Those who knew him in his best days had a high opinion of his ability, but those who met and knew him only in the later years of his life had not a high opinion, either of his ability or integrity. Doctors Wharton and Hand admired him greatly, but Doctors C. E. Smith and Flagg had not a high opinion either of his ability or professional standing. These came in contact with him only after his deterioration. Doctor Day despised him and stated that he spent his entire time concocting new drinks for women.

Before the Civil War, ordinary calls were fifty cents to a dollar, out-of-town calls a dollar a mile, Stillwater, Hastings, Hudson and Minneapolis twenty-five dollars. Confinements were ten dollars up according to the circumstances of the patients, and services rendered. When the war broke out the prices of everything went up and ordinary calls became one to two dollars. Most physicians held to these charges, though newcomers often cut prices in order to get a practice. Doctor Willey was an exception to the rule. He found out what other physicians were charging and then charged more. Willey not only knew medicine as a science, but practiced it as an art and a business. One of his maxims was always to make the medicine "taste good" and put something in it to give the feeling of well-being. For women, the vehicle was apt to be Spirits of Juniper and his tonics were in demand for years after his death, particularly by elderly ladies.

Willey wrote but little, and we know of but four medical articles by him. He was a master of style and these articles are a pleasure to read. They are mentioned in the summary at the end of the year 1869 in the narrative portion of this history. One of these on Dachylius aculeatus infection is the first description of infection by that parasite in the United States and but one instance of that infection has been described in this country since.

CORRECTIONS ON HISTORY OF MEDICINE IN RAMSEY COUNTY

The following corrections should be made in the History of Medicine in Ramsey County on the pages indicated:

Vol. 21, p. 645, line 20—for contract, read contact.
Vol. 21, p. 698, line 2—for Sneling read Snelling.
Vol. 21, p. 701, line 14—delete "who" at end of line.
Vol. 21, p. 793, line 27—for Mrs. read Mr.
Vol. 21, p. 850, line 14—delete "in" near end of line.
Vol. 22, p. 36, line 8—The Arlington Hotel has been torn down.
Vol. 22, p. 37, line 28—Doctor Marsh's initials were O. P.
Vol. 22, p. 39, line 36—Federal Farm Loan Bank building is now occupied by the Minnesota Federal Savings and Loan Association.
Vol. 22, p. 411, line 30—for Lindholm read Lundholm.
Vol. 22, p. 411, line 40—for Percy read Willis Hall.
Vol. 22, p. 415, line 21—Doctor Markoe is still living.
Vol. 22, p. 416, lines 2 to 6—All deceased.
Vol. 22, p. 416, line 48—for 1862-66 read 1863-66.

President's Letter

VENEREAL disease has taken a terrific toll of the health of all peoples in all ages. Its history is marked by some really terrific epidemics following large movements of populations and great wars. Its rôle, even in our so-called enlightened age, is still one of terrible destruction. It is a factor in our population figures and our economics in our sanity rates and our general health.

Great strides have been made, to be sure, in diagnosis and treatment and much credit for staying some of its worst ravages must be given to our prophylactic work in the preservation of sight. But it is only recently that venereal disease has taken on the status in the public mind of a public health menace comparable to other disease scourges. A noticeable change in public opinion is apparent today and treatment is beginning to be sought on the same basis as treatment is sought for tuberculosis, cancer, or diabetes. Our best progress against the great scourge should come with this realistic lay outlook toward its control.

Minnesota can be very proud of its program for the control of venereal disease. Great credit is due the State Board of Health for its accomplishments and we, as practicing physicians, should be the first to acknowledge the worth of their conservative, well established and steadily advancing program.

As a result, there is no doubt that Minnesota stands in the forefront of all the states in venereal disease control. For many years, while effective programs lapsed elsewhere, the Board continued its work and, therefore, statistics as to prevalence quoted for other parts of the country do not apply here. There is no doubt but that Minnesota has pioneered in the field and we are happy to be able to present a favorable report for Minnesota in the material prepared in our October packet on venereal disease.

In this connection it should be noted that the State Board of Health has prepared a special handbook of all of its services to the physician. This handbook will specify the responsibilities of the Board and aid the physician in securing the assistance provided for him in its program.

It has already been sent with the regular News Letter of the association to all rural physicians and is available to all others upon request.

George Earl, M.D., *President*

Minnesota State Medical Association

EDITORIAL

MINNESOTA MEDICINE

Official Journal of the Minnesota State Medical Association

Published by the Association under the direction of its Editing and Publishing Committee

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BUSINESS MANAGER
J. R. Bruce

Volume 22 OCTOBER, 1939 Number 10

MEDICAL SCHOOL FIFTY YEARS OLD

IN THE *Northwestern Lancet* for July 15, 1888, appeared the first full page announcement that the first annual course of lectures at the University of Minnesota Medical School would begin October 1, 1888, and would continue for six months. Three full courses of lectures would be required for graduation. The medical school was to be located at Minneapolis in the building formerly occupied by the Minneapolis Hospital College, and one day each week would be devoted to clinical instruction in the Saint Paul hospitals. The fee for Minnesota citizens would be thirty-five dollars and for all others, fifty dollars. Material for dissection and laboratory work would be furnished at cost.

It was largely through the efforts of Dr. Perry H. Millard that the Minneapolis Hospital College and the Saint Paul Medical College were induced to discontinue operation and the facilities of the two colleges joined in the new venture.

It is unlikely that any of the founders of the medical school envisioned the progress made by the school in its first fifty years (or is it not fifty-one). It is only fitting and proper that such an anniversary should be celebrated with a scientific program such as that which has been arranged for the week of October 9 to 14, inclusive. All those interested are invited to attend the University Convocation, Thursday morning, and the general session in Northrop Auditorium, Thursday evening.

General Clinics have been arranged for the first three days of the week (October 9, 10, 11). The special program for the last three days of the week (October 12, 13, 14) appears in full elsewhere in this issue. A number of well known out-of-state scientists will take part in this unusually attractive program.

Attention is called to the sketch of Fifty Years of Medical Education at the University of Minnesota by Maurice B. Visscher, Professor of Physiology, which appears in this issue.

MEDICINE AND POSTAGE STAMPS

RECENT advices from Washington convey the information that Postmaster General James A. Farley has abandoned the time-honored policy of honoring only great political and military figures on stamps and through his deputy third assistant postmaster general, Mr. Roy M. North, has prepared a list of 35 eminent Americans whose visages have been chosen for the signal honor of being the first to appear on our stamps now that the traditional rule has been abrogated. Very properly, we think, the list is composed of those who have achieved distinction in the domain of arts and sciences and little exception can be taken to the inclusion of most of them. In the case of medicine, however, we cannot but wonder a little, from a relative standpoint, at the mental processes which led to the selection of Crawford W. Long and Walter Reed as the foremost representatives of our profession. Without in any way seeking to belittle their accomplishments, let us see exactly what they did. Long was definitely the first to use ether, but he kept all knowledge of it to himself and to those in his own immediate circle. Garrison states that Welch has admirably said "we cannot assign to him any influence upon the historical development of our knowledge of surgical anesthesia or any share in its introduction to the world at large."

The case of Walter Reed, the other representative of medicine in the list, is somewhat different. Reed was chairman of the army board of four which disproved the old theory of the transmission of yellow fever by fomites and accurately fastened the blame on a particular species of mosquito. It was an epochal piece of work, with the most far-reaching consequences but the important point is that it was a joint effort, for which no one man alone should receive distinction. As matters stand, only Reed is recognized, while Carroll, who was the first to submit voluntarily to being bitten by an infected mosquito, developed the disease and recovered; Lazear, who was accidentally bitten and died, and Agramonte, the fourth member of the Commission, are all but forgotten, as also are Nott and Finlay, who first developed the theory of mosquito transmission of yellow fever, long before anyone else had thought of it. Walter Reed has been signally honored by having his name attached to the foremost military hospital in the United States. That, in all the circumstances, should suffice.

Who, then, it may be asked, are those who are more justly entitled to this recognition? There are many; here are a few: John Shaw Billings, who developed the largest medical library in the world and the largest medical museum in this country, initiated the *Index Catalogue* and the *Index Medicus,* compiled the Medical and Surgical History of the War of the Rebellion, designed the buildings of the Johns Hopkins Hospital and laid down the fundamental principles on which the growth and importance of its medical school have occurred, spending the last seventeen years of his life in the monumental task of reorganizing the New York Public Library System. "Altogether," says Garrison, again, "Billings did a giant's work for the advancement of American medicine." Then, there is William Beaumont who, single-handed and in the crudest surroundings, conducted a series of experiments and made basic findings in the physiology of digestion, so thoroughly accurate that today they remain unchallenged. There is Samuel D. Gross, the foremost American surgeon of the first half of the nineteenth century, who, just 100 years ago this year, wrote the first exhaustive treatise on pathological anatomy in the English language and made many notable contributions to the development of American surgery.

Perhaps we should be thankful that American medicine received any recognition at all in Washington at this time. But as long as those people there were at it at all, it seems as though they might have done a better job.—*G. C.*

CRYPTORCHIDISM

The general practitioner confronted with a case of cryptorchidism may well feel somewhat uncertain as to the proper advice to give. If he has read the surgical journals he will have found numerous reports of operative procedures and recommendations that these youngsters be operated on early in life, or at least before puberty. If he has analyzed the reports of follow-up examinations following operation, he will have found that the results of orchidopexy are far from satisfactory, if a normal testis in its normal position is the objective.

If one has followed the reports of the results achieved by glandular therapy he will have read of unbelievable success in the hands of some and of failure by others. The successes seem to have been more frequent when this kind of therapy has been given to boys approaching puberty. The production of premature puberty is one undesirable result which should and can be guarded against.

Many of the older generation of physicians and even the laity have personally observed instances where undescended testes have spontaneously descended at puberty. This may account for the fact that comparatively few of these youngsters are operated upon. There is said to be an old legend in the South that all these testes descend at or just after puberty.

There has been need for some time for observation of a large number of boys over a period of years to determine the incidence of cryptorchidism and what happens to the undescended testis if left alone. This has now been done.*

Johnson had the opportunity of examining 31,609 boys ranging in age from seven to seventeen and found 544 cases of undescended testis. This is an incidence of seventeen per 1,000, considerably higher than the two to five per 1,000 found in various army recruits. This in itself strongly suggests that spontaneous descent occurs in a majority of cases.

During the period of observation from the years 1931 to 1937, the author found that spontaneous descent occurred in 313 of the 544 boys. This occurred at all ages from seven to seventeen, most often, however, at the ages of eleven to fourteen inclusive. No follow-up examinations were made after discovery of the condition in sixty-three instances, and 154 of the 544 boys were lost to observation. In the fourteen cases submitted to orchidopexy the results were extremely discouraging.

The author's conclusion was that while endocrine therapy should be used only as an adjunct at puberty it is not in reality a necessity. He also concludes that orchidopexy should not be attempted before the sixteenth year unless indicated by some associated condition.

The late spontaneous descent of the testis in a majority of cases of cryptorchidism need no longer be considered a legend but rather an observed fact.—C.B.D.

WORLD WAR II

UNTIL recently it seemed inconceivable that there could be a repetition of the World War within the short space of twenty-five years. Anyone would have thought that the loss of life, maimed bodies, starvation, mental grief and economic loss, which attended the last war, being within the memory of present-day leaders, would have been fresh enough in their memories to have forestalled the present conflict, which has been going on for a month.

The whole purpose of the medical profession is the antithesis of war. The profession has always striven to save lives, prevent accidents and preserve the health and nutrition of human beings. All success along such lines has been many times counteracted by periodic wars.

When war comes the medical profession is called upon to patch up war injuries as best it can and to control epidemics in armies and in the civil population incident to abnormal conditions.

The medical profession has ever been ready to render its service for the alleviation of human suffering in time of war, as in time of peace. It is to be devoutly hoped, however, that World War II will be much shorter than World War I.

Salyrgan Suppositories and Mercurin

A Warning and Acceptance of Salyrgan Suppositories Rescinded.—Salyrgan, which is sodium [o(hydroxymercuricmethoxypropylcarbamyl) phenoxy] acetate, was accepted by the Council on Pharmacy and Chemistry in 1928 on evidence presented by the manufacturer, the Winthrop Chemical Company, of its usefulness as a mercurial diuretic. In 1937 the Council accepted Suppositories Salyrgan of the following composition: Salyrgan 0.4 Gm., corn starch 0.1 Gm., and cocoa butter 1.3 Gm. In the same year the Council accepted Mercurin Suppositories 0.5 Gm., distributed by Campbell Products, Inc. Mercurin is a mixture of 20 per cent of the B-menthoxy-v-hydroxymercuripropylamide of trimethyl cyclopentane dicarboxylic acid and 80 per cent of its sodium salt. Subsequently Dr. Arthur C. DeGraff, professor of therapeutics at New York University, reported several cases of definite rectal irritation following the use of Salyrgan Suppositories (J.A.M.A. 113:214, July 15, 1939). Dr. DeGraff and his associates concluded from their investigation that "Salyrgan Suppositories appear to be more irritating than Mercurin Suppositories," and "the fact that severe ulceration occurred in three patients out of eighteen would suggest that this dosage form of Salyrgan is inadvisable." Similar reports were received from a number of other physicians who had been consulted by the Council in regard to their experiences with Salyrgan Suppositories. The Council therefore voted (1) that the acceptance of Salyrgan Suppositories be rescinded without prejudice pending the receipt of further reports from the manufacturer; (2) that the acceptance of Mercurin Suppositories be continued but that it be rescinded at any time should evidence become available entailing the necessity of such action as provided in the Council's rules, and (3) that publication of its report and a warning as to the local irritating effects of both drugs be authorized. (J.A.M.A., July 15, 1939, p. 213.)

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*Johnson, Wm. W.: Cryptorchidism. Jour. Am. Med. Assn., 113:25, (July 1) 1939.

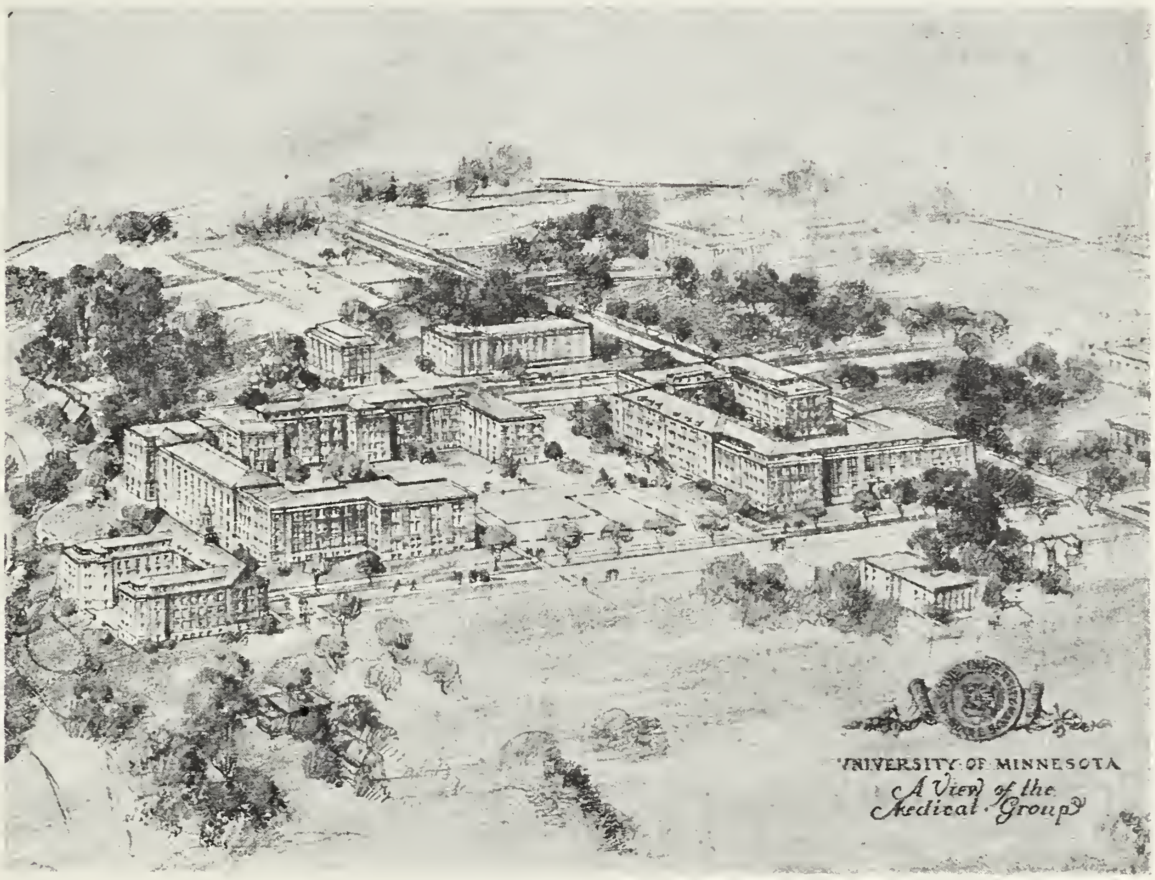
FIFTY YEARS OF MEDICAL EDUCATION AT THE UNIVERSITY OF MINNESOTA

MAURICE B. VISSCHER, M.D.

University of Minnesota

Minneapolis, Minnesota

THE Medical School of the University of Minnesota celebrates, this year, the completion of a half century of service to the State. It is appropriate on such an occasion to survey the history of the past and to consider the future.


UNIVERSITY OF MINNESOTA
A View of the Medical Group

Medical education in pioneer days in Minnesota, as elsewhere, was carried on by the Preceptor system, in which young men apprenticed themselves to practicing physicians. They studied anatomy and pathology as best they could from books and the rarely available human corpses. Real scientific training did not exist. They followed their teachers about on their calls and learned by example how to handle the human problems of illness. Skilled artisans they learned to be, but aside from the more primitive procedures their practice was a far cry from medicine of today.

After preceptors came the proprietary medical schools—a great advance in that time. The first of these was the St. Paul Preparatory School, housed in a single second story room of the morgue in the rear of St. Joseph's Hospital, where Drs. Daniel W. Hand, Alexander J. Stone and others attempted to impart the rudiments of medicine to a handful of hopeful students. So medical education began in this community on an organized basis around the middle of the last century.

The direct lineal parents of the Medical School of the University of Minnesota were the St. Paul Medical College and the Minnesota Hospital College. Joining them somewhat later were the Minneapolis College of Homeopathic Medicine and still later the Medical Department of Hamline University. These schools operated under charters from the State which permitted them as stock companies to carry on the enterprise of medical education and the granting of degrees, which were originally in effect certificates of the right to practice medicine.

These conditions were chaotic from our point of view, but it must be remembered that a similar state of affairs prevailed in the rest of the country, and conditions were just becoming ripe for a drastic change. The University and the medical profession can both point with pride to the parts they played in bringing about those changes which clarified the situation. In 1883 a plan was prepared by Dr. Charles N. Hewitt, then State Health Officer; Dr. William H. Leonard, a prominent Minneapolis physician, and President William W. Folwell of the

University, which called for the setting up of the College of Medicine and Surgery of the University of Minnesota with examining but no teaching functions. The Board of Regents of the University set up the College in that year and the Legislature passed the first Medical Practice Act for the State of Minnesota requiring all physicians to register with and be examined by the faculty of this College.

This forward-looking movement had consequences unforeseen at its inception. It was begun in order to be able to set some standards of education for medical practice. Those standards were low enough to be sure. They consisted of certification by diploma or examination that a candidate had attended one full course of lectures, which were usually completed in less than a year, and gave evidence of clinical and laboratory experience including dissection of the muscular, nervous and circulatory systems. No preliminary training of any sort was required. The real virtue of this Act was its moral rather than its immediate practical consequences. It established the principle that the practice of medicine was to be considered a profession and not a trade for whoever wished to ply it, and it provided a precedent for later steps.

The next step occurred in four years, when the Legislature created an independent Board of Medical Examiners under the first law of its type in the United States. It invalidated the Diploma as an evidence of fitness to practice and substituted personal examination of every applicant for a license to practice in the State of Minnesota. Indirectly this law established the Medical School of the State University, because it created the conditions which made proprietary medical education impossible. In fact in the next year the two schools named above petitioned the Board of Regents of the University to organize a teaching medical school, and offered to surrender their charters and properties to such a school when organized. Their offer was accepted and thus began the College of Medicine and Surgery, now changed in name to the Medical School of the University of Minnesota.

A detailed history of the changes in the Medical School in the past fifty years would occupy more space than is available, and would be more tedious than profitable. The significant events in highlight were associated with two steps: the founding in 1888 and the reorganization in 1913. The founding pioneers saw the need of improved medical education but did not fully understand how such improvement had to be brought about. The faculty which began the work of the School was, with the exception of the Professor of Chemistry, a group of practicing physicians. With every good intention it was difficult, if not impossible, to make physiologists, anatomists, bacteriologists and pharmacologists out of this group. The first expedient tried was to bring in assistant professors and instructors who had prepared themselves specifically in the above-named branches, leaving the original group in the administrative professorial positions. The scientists brought to the University in those junior positions prior to 1913 did great service, and if given authority might well have reorganized the fundamental science departments in a satisfactory way over a longer period of time. The need for full-time clinical workers began to be felt acutely with the erection of the Elliot Memorial Hospital, which was occupied in 1911, having been built at a cost of $160,000, the larger portion of which represented a bequest from Dr. and Mrs. A. F. Elliot.

At the risk of temporarily alienating the affections of parts of the medical faculty, under the leadership of the then President George E. Vincent, a Committee, consisting of three members of the medical faculty, Drs. F. F. Wesbrook, Charles L. Greene, and James E. Moore, and three alumni, Drs. Louis B. Wilson, Edward L. Tuohy and Theodore Bratrud, was charged with responsibility by the Regents for recommending to them a plan of reorganization. Acting upon the advice of this committee the Regents greatly reduced the size of the faculty and created an Administrative Board, consisting of the Dean, the superintendent of hospitals, the directors or heads of each department and one member-elect from the faculty at large to conduct the affairs of the Medical School. In addition, recommendations were made to reorganize the personnel of several departments.

At this juncture, Doctor Wesbrook, who had occupied the Deanship for nine years, resigned to become President of the University of British Columbia. Thus, in order to carry into operation the reorganization program, a new leader had to be sought and President Vincent selected the late Elias P. Lyon, who had previously been Dean of the Medical School of St. Louis University. Lyon had been a distinguished pupil of the physiologist, Jacques Loeb, and served the University of Minnesota for twenty-three years as Head of its Department of Physiology and Dean of its Medical School. He was a great leader because he combined several important qualities. He was, first of all, convinced of the importance of the scientific method in medicine; he respected scholarship and serious scholarly work; he appreciated, more than many persons of pure scientific training do, the importance of a thorough practical training in clinical medicine, and, finally, he was deeply impressed with the great social importance of the medical profession. Dean Lyon came to Minnesota with the reorganization program begun and it was his task to carry it through. It may be said at the outset that a great deal of the bitterness engendered by the changes made was wrongly directed at him as the symbol of the whole reorganization scheme. The die had been cast before his appointment and in cutting to the line he was simply following the line of duty. In the year of his appointment new heads took charge of three pre-clinical departments and two years later the first full-time appointment to the Headship of the Department of Medicine was made.

In building his staff, Dean Lyon was concerned, first of all, with the spirit of productive scholarship. He believed firmly that no educational institution of quality could survive unless its staff were imbued with the investigative spirit. His determination to establish a group of medical teachers with such attitudes may be said, quite fairly, to be one of the most important reasons for the existence of the active medical research and teaching center in the University of Minnesota today. Within five years after his appointment he had major responsibility for the selection of seven department heads. The quality of those choices largely determined the character of the Medical School.

An interesting chapter of medical education is told in the record of changes in educational requirements. In the year 1888-9, the stated prerequisite to entrance to the Medical School was a High School diploma. Even this requirement was frequently waived on examination. The medical course at that time covered three years and the total enrollment was seventy-five students. Four years of medical school work were required first in 1895-96. One year of work of collegiate grade was required as a prerequisite for entrance in 1902, two years in 1903, and beginning in 1939 three years constitute the minimum entrance qualification. A fifth or interneship year became a requirement for the M.D. degree in 1916. With the increase in requirements there has been no decline in the number of students undertaking medical education. Actually, various factors have operated to greatly increase the number of applicants for admission. Registration in the Medical School is now limited to one hundred first-year students, who are chosen from applicants numbering several times that figure. As a result a new duty has fallen upon the School, that of selecting the most promising students for training. This duty to the community is of the greatest importance because the ultimate quality of the physicians who will one day serve it, depends so largely upon the quality of the raw material from which they come. Every effort is made to give proper weight to scholastic ability on the one hand and to those imponderable personal factors which determine the difference between a competent physician and an incompetent or mediocre one.

No account of the Medical School of the University of Minnesota would present a balanced picture without mention of graduate and post-graduate education. Graduate work of a sporadic nature was done before 1913, but the comprehensive program which has made the institution an important factor in American medicine was initiated at that time. In the past twenty-five years nearly one thousand persons have been granted graduate degrees in the various medical fields by the University of Minnesota. These graduates are scattered over the face of the earth and their work, whether it be strictly clinical or combined with teaching or research, is, in large part at least, a result of the graduate teaching program of this University. Again, in this aspect of the School's work, the mark of President Vincent is visible. His appointment of Guy Stanton Ford, now President of the University, to the Deanship of the Graduate School had important consequences. Under Dean Ford's leadership, scholarly work flourished. The Graduate School became a division of the University in which principles and not fixed regulations ruled, in which quality and not quantity of production was at a premium. It is, perhaps, paradoxical but not at all surprising that the amount of graduate work carried on increased greatly under such conditions.

In this work the establishment of the Mayo Foundation as a branch of the Graduate School in 1915 has had an important effect, in that it placed the entire facilities of the Mayo Clinic in the graduate medical teaching program of the University. The Mayo Foundation plan has proven to be fundamentally sound and productive. It has greatly extended the University's opportunities for graduate training of physicians and allowed it to exert its influence in instilling the investigative spirit and principles of sound scholarship into a large and growing group of physicians.

In Minneapolis the facilities of the General Hospital and the University Hospitals provide the major clinical opportunities for graduate teaching. The preclinical science departments are providing training for a considerable number of specialists in the several fields, and are increasingly serving to give extensive background training in scientific investigation for students who later enter various clinical branches.

Recently the Medical School has inaugurated a program of post-graduate training for physicians, the aim of which is to provide opportunity for active practitioners to drop their work for short periods of intensive study in particular, limited fields. The combined Minneapolis and Rochester faculties as well as distinguished specialists from other centers have cooperated in carrying out this venture in "continuing education." This type of program is assuming greater importance daily with the accelerating pace of medical progress. With new therapeutic agents appearing and great advances in fundamental knowledge, keeping abreast of the times in the field of medicine is an extremely difficult but none the less important problem for the practicing physician.

The first fifty years are now past. Those years are important in having laid the groundwork for the present and the future. The years that lie ahead are now the important ones and the story that can be written fifty years from now is our concern. It is well to be proud of a distinguished past but it is a calamity to allow pride to engender complacency. Persistent effort is the price of progress, and it is the task of our generation to carry on the tradition of consistent symmetrical growth which is the heritage of our institutional past. The continued development of an active center of medical teaching and investigation in Minnesota is of utmost importance to the progress of the medical profession in the State. Such development is impossible without the sympathetic support of the profession within the State. There is here a peculiar interdependence of interest which should be cultivated to mutual and general public advantage.

Medicine as a profession is so peculiarly an activity of public interest that the community as a whole is always the real beneficiary of any medical progress.

By the code of physicians no private gain comes, save indirectly by virtue of increased demands for service, to any physician who discovers new or improves old methods of treatment, diagnosis or understanding of human disease. The physician is almost peculiar in having as his main occupation, work which will make his own services unnecessary to his patients. Although advances in medicine are undoubtedly a source of the greatest personal satisfaction to physicians, the real gain produced by them accrues to the public at large.

It is, therefore, with the clearest conscience that the medical profession can urge generous public support of medical education and research. The record of research accomplishment at the Medical School of the University of Minnesota is such that no reasonable doubt can be entertained that funds expended in it will be well spent. This is not the time or place to enumerate all of the achievements, but it may not be amiss to mention the important work on inanition, on growth, in hematology, on kidney diseases, on edema, on intestinal obstruction, on essential fatty acids in nutrition, on virus diseases, on epilipesy, on gallbladder function, in endocrinology, in immunology and in many other fields, where outstanding contributions have been made.

In supporting this work the people of the State of Minnesota have advanced their own interests and have repaid in part the debt it owes to the past for the heritage of science and culture which it enjoys. It is our duty as informed members of the profession of medicine to remind and keep reminding the community at large that scientific fruit does not grow without nurture and trouble and expense. The future of Minnesota Medicine depends very definitely on continued public awareness and support of medical education. The record of the next fifty years of the Medical School of the University of Minnesota will be determined mainly by two factors, the acuity of vision of its various responsible officers and the adequacy of support with which the community will provide it. It is perhaps not too much to hope that the second half century may see as much progress as the first.

MEDICAL BROADCAST FOR OCTOBER

The Minnesota State Medical Association Morning Health Service.

The Minnesota State Medical Association broadcasts weekly at 11:00 o'clock every Saturday morning over Station WCCO, Minneapolis (810 kilocycles or 370.2 meters) and Station WLB, University of Minnesota (760 kilocycles or 395 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota. The program for the month will be as follows:

October 7—Social Hygiene
October 14—Fiftieth Anniversary of Medical School
October 21—Nursing Education
October 28—Dental Progress

In Memoriam

Delbert F. Dumas

(1879-1939)

DR. D. F. DUMAS, Bemidji, Minnesota, died August 8, 1939, at the age of sixty.

Dr. Dumas was born April 4, 1879, at Waterville, Minnesota, and spent his boyhood in Minneapolis. He attended the University of Minnesota Medical School, later graduating from the University of Illinois in 1902.

He began practice at Foley, Minnesota, later going to Cass Lake and Deer River, where he was located for many years before going to Bemidji.

In 1908, Dr. Dumas married Hazel Jarvis at Cass Lake. He is survived by his widow and two sons, Fred and Delbert F., Jr.

Dr. Dumas was a member of the Elks Lodge, and an ardent Democrat. When his health permitted he was active in civic affairs at Cass Lake and Deer River, and later in Bemidji.

John Andrew Evert

(1885-1939)

DR. JOHN A. EVERT, chief surgeon at the Northern Pacific Beneficial Association Hospital at Glendive, Montana, died at Glendive, August 17, 1939.

Dr. Evert was born at Covington, Kentucky, August 11, 1885, and spent his youth in Atlantic City and Philadelphia. In 1905 his family moved to Saint Paul and he graduated from Macalester College, Saint Paul, and received his medical degree from the University of Minnesota in 1913. Upon graduation he became Assistant Chief Surgeon at the Northern Pacific Beneficial Association Hospital at Brainerd, Minnesota. The hospital was moved to Saint Paul in 1921 and he was assistant chief surgeon there until 1925, when he became chief surgeon at the Association Hospital in Glendive, Montana.

Dr. Evert served in the army medical corps during the World War and took special work in brain surgery in New York during that period. In Montana he was, at different times, a member of the State Board of Medical Examiners, president of the Eastern Montana Medical Association, and, in 1937 and 1938, president of the Montana State Medical Association.

Dr. Evert was a member of the Nu Sigma Nu medical fraternity and attended the meeting of the Minnesota chapter in Saint Paul last spring, where he met many of his fraternity brothers. He was also a member of the College of Surgeons and the Montana State and American Medical Associations.

In 1915, Dr. Evert married Pearl A. Nash of Pipestone, Minnesota. He is survived by his wife, two sons and a daughter. One son, John A., Jr., is studying medicine at Harvard and the younger, Robert, plans also to follow in his father's footsteps.

Dr. Evert had a host of friends in Minnesota. He was devoted to his family, most conscientious and careful in his medical and surgical work, loyal to his friends and his profession. His patients loved him, his friends trusted him and everyone respected him. His was a life full of service.

Olaf E. Heimark

(1873-1939)

DR. OLAF E. HEIMARK, Duluth, died July 17, 1939, of broncho-pneumonia at the age of sixty-six.

Olaf Heimark was born October 14, 1873, at Clarkfield, Minnesota. He attended Saint Olaf College and the University of Minnesota, and received his medical degree from the Minneapolis College of Physicians and Surgeons in 1899.

Dr. Heimark practiced at Hawley, Minnesota, until 1911 when he moved to Duluth where he was local surgeon for the Northern Pacific Railway from 1917 until the time of his death. He was a member of the Zion Lutheran Church and was the first president of the Duluth Lutheran Brotherhood. He was a member of the Saint Louis County Medical Society, the Minnesota State and American Medical Associations. He was a member of the staffs of the Duluth hospitals.

In 1901, Dr. Heimark married Anna Rebecca Peterson. She, as well as two daughters, Mrs. Allen Crassweller, Duluth, and Mrs. Robert Mott-Smith, Hilo, Hawaii, and one grandchild, survive him.

Dr. Heimark served on the local Draft Board during the World War. Being an ardent sportsman he always found time for two hunting trips each year. He worked hard and read extensively. A man of pleasing personality, he made friends readily and will be missed by a large circle of patients and friends.

Reginald H. Jackson

1876-1939

DR. REGINALD H. JACKSON, well known surgeon of Madison, Wisconsin, founder of the Jackson Clinic, died at his summer home at Breeze Point on Lake Mendota, September 7, 1939, at the age of sixty-three.

Born in De Pere, Wisconsin, January 17, 1876, Dr. Jackson was the third generation of surgeons in his family. His father, the late Dr. James A. Jackson, and his grandfather, Dr. Joseph Hobbins, came to Madison from England in 1853, and he had lived in Madison since he was a small child.

After graduating from the University of Wisconsin in the classical course, Dr. Jackson obtained his medical degree from the College of Physicians and Surgeons in New York City. After taking his internship at the Presbyterian Hospital in New York City, he served as house surgeon and then joined his father in practice at Madison.

In 1906 he built a medical office building, now occupied by the city board of health, and practiced with his father. In 1911 they were joined by his brother, Dr. James A. Jackson, Jr., who had recently graduated from Columbia, and the Jackson Clinic began operation. Other specialists were added, including another brother, Dr. Arnold Jackson, who received his training at the Mayo Clinic. Working first at the Madison General Hospital and the Sisters' Hospital, upon the building of the present Methodist Hospital, in 1927, the Clinic worked there, moving its offices to the hospital in 1929.

Dr. Jackson married Elizabeth Breese Stevens, June 4, 1908. Their only child, Dr. Reginald Jackson, Jr., has, for the past three years, been his father's assistant.

Dr. Jackson was a member of the Southern Surgical Association and of the Western Surgical Association, of which he was president in 1935. He was also a Fellow of the American College of Surgeons, and a member of the board of governors of that society. In 1933 he was president of the State Medical Association of Wisconsin, and helped to form the Wisconsin Surgical Club. He also had been, for a number of years, a director of the First National Bank of Madison and was a member of the University Club of Chicago, the Maple Bluff Golf Club, and the Madison Club.

SUBUNGUAL GLOMUS TUMOR

(Continued from page 708)

thenar and hypothenar eminences, and on the arms and legs. Clinically, if close to the surface, they present a dark red or purplish color, and are excruciatingly tender, often incapacitating the patient. Occasionally, they lie more deeply beneath the surface and are therefore invisible, but nevertheless cause much pain.

Microscopically, the tumors consist of tortuous cavernous blood vessels. The lining endothelial cells are cuboidal, and occur in several layers. Some vessels show a layer of circular muscle cells gradually passing into a zone of pale epithelioid cells, which are characteristic of these tumors. The sections from the case under discussion showed most of these characteristics, and left no doubt as to the diagnosis.

These tumors are benign. Surgical removal results in complete cure. An occasional case which has been subjected to x-ray or radium treatment[1] has not responded, and required later surgical excision. In no case has recurrence been noted during the period observed.

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MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
W. F. Braasch, M.D., Chairman

PUBLIC HEALTH IN MINNESOTA

Attempts to solve the problem of providing adequate medical care for everyone and of establishing an equable distribution of its cost are being made by numerous county and state medical societies. Organized medicine deserves great praise for its efforts and it would seem that with the advantage of first-hand knowledge of conditions as they are, it should be in a position to arrive at some solution of the problems involved much better than federal or other agencies.

The Minnesota State Medical Association at its last meeting took the stand that, while it was intensely interested in the outcome of the various plans being tried, it seemed advisable for the present to await the results of these efforts in the hopes that some solution would be arrived at. However, this does not mean that the members of our State Association should sit idly by and make no attempt to solve some of the other problems affecting the care of the sick.

Many Problems Unsolved

There are many problems intimately related to public health which are far from being solved. Without going over the entire list, it would seem that the problems of maternal and infant welfare and of pulmonary tuberculosis are more urgent than some others. While it is true that the statistics concerning maternal and infant welfare are more favorable in Minnesota than in many other states, nevertheless there is still room for improvement. There is no reason whatever why federal health service should take the lead in such a campaign. If this could be brought about by the united efforts of the members of the State Medical Association, it would redound greatly to their credit. This problem should be regarded as the personal responsibility of each and every member of the Association. It is true that the Committee on Maternal Welfare has accomplished much and that the activities of the State Board of Health have been of great value. However, much more could be done to improve the situation if every member of the Association would assume a personal responsibility in the campaign.

County Societies Should Lead

The fight against tuberculosis has a similar status in Minnesota. While statistics in this state are comparatively favorable, largely as the result of the activities of the Minnesota Public Health Association and its efficient branches, nevertheless there is still room for improvement. The members of the State Medical Association have coöperated with the Public Health Association in their efforts to stamp out the disease, but they have not assumed personal responsibility to the degree which is necessary to lower the incidence and mortality of the disease. Here again is an opportunity for our County Societies to take the lead and enlist their members in making an individual and personal effort to combat this great problem. Such action should be not alone our professional duty, but it would add materially to our position in public opinion.

Immunization Needed

The percentage of inhabitants in rural districts of Minnesota who have not been immunized against smallpox and other contagious disease is appalling. The Council is taking active steps to secure more thorough and widespread vaccination and immunization by the practitioner. They have enlisted the coöperation of the County Medical Society in taking more active steps, which should result in greatly improved conditions. There are many other fields which might be cited, but if the problems in the three fields mentioned are attacked by the combined efforts of our county organizations, our State Association will have accomplished a great deal.

MEDICAL INSURANCE IN MICHIGAN

With but one dissenting vote the House of Delegates of the Michigan State Medical Society has now decided to embark upon a program of health insurance for Michigan.

Representatives of many other state medical societies, East and West, were present last month when the vote was taken to hear discussions and carry back to their own societies details of the Michigan plan, first of its sort to be organized on a state-wide scale in the middle west states. Several types of county plans are under way under state medical society sponsorship in Wisconsin, the only other middle west state to try insurance. California is already at work on a state-wide insurance plan in the West and Massachusetts, New Jersey, Connecticut and New York are in various stages of preparation for their own versions of medical insurance in the East. In addition, several large city medical organizations throughout the country are working on similar plans for metropolitan communities.

Critics Should Note

In fact, the number and variety of experiments now being planned under medical sponsorship should certainly be drawn to the attention of critics who charge organized medicine with timidity and social backwardness. Probably no private individuals have ever before engaged in such widespread social experimentation on their own initiative. Habits of scientific experimentation are ingrained in these pioneers and it is certainly not unreasonable to expect that some reliable principles and well tested figures, at least, will come out of their studies.

Whether the results will be what the most enthusiastic promoters hope for remains, of course, to be seen.

$4.50 for Families

The Michigan plan as approved by the delegates at Grand Rapids calls for payments of $2.00 a month for single men and women, $3.50 a month for man and wife and $4.50 a month for man and wife and children. The age limit is sixty-five. It is limited, so far as income goes, to single persons with $2,000 a year or under and to families of $2,500 a year or under. It is also limited to employed groups. It is possible that the granges in rural districts, fraternal groups and service clubs that come within the income limits may be included. There is expectation, also, that some employers will finance the plan for their employees.

In addition to their monthly premiums, all subscribers must pay for the first five dollars' worth of medical service together with a $1.00 initiation fee. Furthermore, except for emergencies, they are not eligible to medical service for a month after they have joined the plan and no benefits are provided in obstetrical cases until twelve months after joining.

Subscriber Benefits

The benefits to subscribers are as follows: For single men or women, medical services worth up to $325 yearly. For man and wife, medical services worth up to $550 yearly and for man and wife and children, medical services worth up to $875 yearly. There is a further limitation placed upon cancer, tuberculosis, venereal disease and nervous and mental disease. For these diseases only diagnosis is included on the service. With these exceptions complete medical and surgical, diagnostic and consultation services are provided.

Fees to Physicians

Payment to physicians will start on a fee schedule already drawn up and tentatively approved. This schedule provides $2.00 for an office call, $3.00 for a home call and $5.00 for a night call. Mileage is paid one way beyond city limits at 50 cents a mile for the first ten miles and 25 cents thereafter. The average obstetrical fee together with post partum care is $25.00. The fee for an appendectomy or herniotomy is $75, for a cesarean section $100 and for a hysterectomy, $125. For the fracture of radius or ulna including Colles the fee is $25; for fracture of the humerus, $35; the tibia, $35; the femur, $75; one rib, $10. X-ray examination of toe or finger is $5.00; of lungs, $10; of the gastro-intestinal tract, $25. These are random selections but they indicate the general level of fees to be paid. They will be scaled down, to be sure, if the income does not justify full payment of the schedule. Michigan Medical Service will make collections, pay doctors.

Many adjustments may have to be made both in monthly payments and in methods of organization and collection as time goes on and experience is accumulated.

Laux Is Executive Head

Direction of the plan is in the hands of a Board of Directors of some 35 members of whom two-thirds are to be duly licensed physicians. Mr. J. D. Laux, formerly with the American Medical Association's Bureau of Medical Economics, will act as executive secretary for the plan under the direction of the Board.

Final details have yet to be approved by the insurance commissioner of the State of Michigan but this official sat in on all preliminary conferences and his approval is virtually assured. Enabling legislation was sponsored by the society and passed at the last session of the Michigan legislature. The Michigan Medical Service is, of course, a non-profit organization.

Will It Sell?

Will people purchase this insurance as offered to them by the doctors of Michigan? Nobody really knows.

To be successful a large number of employed people must purchase the insurance. In groups of twenty-five subscribers, 95 per cent of employees must be members. In groups of 100 or more, 75 per cent of employees must be members.

If it is not successful, what then?

Many critics of health insurance plans believe that unsuccessful voluntary plans lead inevitably to compulsory government insurance. Friends of the plan counter with the observation that voluntary plans do not lead to compulsory plans except where government had a hand in the first place. They believe that the plan or an adjustment of the plan will be successful and that, being successful, it will for all time prevent further encroachment of government agencies into the field of private medicine.

Leaders Here Study Plan

On the other hand, medical leaders in Minnesota are studying health insurance and especially the Michigan experiment. In their opinion nothing is lost and much is likely to be gained by proceeding slowly in this uncharted field.

NEW FEDERAL FUNDS

When the dust and heat of adjournment had cleared away, several unexpected gifts were found to have been left by Congress on public health doorsteps.

Failing to secure consideration at this session of the Wagner Health Bill, Senate backers included several appropriations for special public health projects in the deficiency bill.

Information as to exact amounts and possible strings attached has been difficult to obtain and confused when it arrived; but the gifts came as a complete surprise to most health officers and medical bodies throughout the country.

It seemed likely, however, that a few thousands of dollars might be secured for certain specific and limited projects in Minnesota—provided the projects met with the approval of the United States Public Health Service or the Children's Bureau.

Discussed by Board and Council

A joint meeting of the Council of the Minnesota State Medical Association and the Minnesota State Board of Health was accordingly called at the end of August to discuss policies for Minnesota before scheduled conferences with officials of the Public Health Service and the Children's Bureau should take place in connection with the meeting of the American Congress on Obstetrics and Gynecology at Cleveland in September.

Dr. Chesley, speaking at the joint meeting, quoted the Assistant Surgeon General of the health service as follows:

"While recognizing the need for extending and strengthening basic public health organization of this country, the Senate Committee on Finance, in recommending this deficiency appropriation, mentioned specifically the inadequacy of present service in respect to pneumonia, cancer, malaria, industrial hygiene, dental hygiene, tuberculosis and maternal and child health. It, therefore, would seem desirable that proposals submitted by the States give appropriate consideration to these special disease problems."

Not Continuing

The amount that would be available to Minnesota under this appropriation was estimated at $9,996.82, Dr. Chesley said. It would not be a continuing yearly appropriation and, if secured, should undoubtedly be used for some special self-limited program.

One proposal for an obstetrical consultation service in rural Hennepin and Ramsey Counties was tentatively outlined, consultants to be paid out of the fund.

The possibility of using the fund to purchase a portable x-ray unit for use in making chest x-rays of contacts among the indigent and the Indians in connection with the epidemiology in tuberculosis was also suggested.

The program of the Board in cancer, tuberculosis, industrial hygiene, malaria control and pneumonia were briefly reviewed by Dr. Chesley and certain suggestions as to possible uses of the extra money in several of these programs were made, subject to approval of the Council.

Industrial Program Underway

Nothing has been done in cancer control work except that an appropriation was made for publication and distribution of leaflets to the Women's Field Army of the American Society for Control of Cancer, Dr. Chesley said.

A survey of the malaria situation in Minnesota is now underway with other funds and laboratory service is already available in the Health Department for the industrial hygiene program as it is now constituted. Though it is known, incidentally, that Secretary of Labor Perkins favors transfer of all industrial hygiene work to the Department of Labor, all professional and health agencies are united in the belief that such work belongs to health departments and should be kept there.

Might Purchase Pneumonia Sera

Dr. Chesley expressed the opinion that some of the funds thus made available might well be used to furnish pneumonia serum, the program having been curtailed as a result of the action of the last legislature. If the money is used for sera, it will not be necessary to ask the Division of Social Security to make arrangements with county welfare boards to make up the deficiency.

Education in Care of Prematures

A sum of approximately $2,500 has been made available specifically for maternal and child hygiene work out of unexpended funds of the Children's Bureau. The plan formulated by the Division of Child Hygiene for use of this fund was explained to the Council by Dr. V. O. Wilson. It calls for a three-day postgraduate course at the Center for Continuation Study on the University Campus, the subject to be New Methods of Care for Premature Infants. Tuition and expenses for the course will be paid out of the fund for specially selected physicians from all parts of the state, the understanding being that the physicians will then return and present the information to medical societies and hospital staff meetings.

Course Approved

The plan outlined by Dr. Wilson was specifically approved by the Council, also the general program now carried on by the State Board of Health as outlined by Dr. Chesley.

Possibilities for use of the new fund including the purchase of the portable x-ray and for the obstetrical consultation service were discussed but approval was withheld until more definite and concrete plans can be submitted.

Vaccination Campaign

A campaign for vaccination and immunization of children is about to be launched by the Olmsted-Houston-Fillmore-Dodge County Medical Society, Dr. T. B. Magath told Council and members of the Board. He asked for advice as to the most practical method of approaching the problem in rural districts.

Councilors reported that, in some cases, children were sent to the doctors' offices; in others, medical society members went to the schools. In some instances those who could pay were assessed 50 cents each with the Red Cross or other agencies assisting in providing payment for those who could not pay their own fee. In Minneapolis the children went to the private offices of their physicians, and the welfare board paid for those who were unable to pay for themselves at a regular fee of one dollar for each vaccination.

Few Protected

It was the consensus that each community should settle upon its own plan but efforts by physicians should be unflagging to see that all children in their communities are vaccinated and immunized.

Studies reported upon by Dr. Magath in his section of the state showed that only 16 per cent of the children had been vaccinated. Dr. Magath is in charge of the campaign for his county society. He is also a member of the State Board of Health.

Subsequent discussion of the problem by Council members revealed a keen interest on the part of all of them in the problems of protecting school children. No definite action on the matter was taken at this meeting; but a survey of methods tried out by county societies throughout the state will undoubtedly be made later and recommendations formulated for state-wide action.

New Diabetes Booklet

The booklet, "Diabetes—How to Make It Harmless," was published several years ago by the Committee on Diabetes. It proved extremely popular with physicians and patients. The committee decided to republish and bring it up to date at a meeting held in Minneapolis. The Council approved the action of the committee and the finance committee will make budget provision for printing expense. The booklet will sell as formerly at 10 cents a copy and will be available to private patients through their physicians.

Equable Distribution

Medical care of injured WPA employees in Minnesota has been handled for some time in accordance with a plan drawn up in coöperation with the Minnesota State Medical Association. Lists of members who were willing to accept these patients were secured through the state office, and every effort has been made by WPA administrators to see that patients had their choice and that there was no unfair concentration of the work in any quarter. Difficulties and complaints have been registered in Washington from other states, however, with the result that a statement by a medical society representative is now required each month to the effect that work is being equitably distributed.

At the direction of the Council, therefore, the executive secretary will examine the books each month. If the distribution of work appears uneven anywhere in Minnesota, he will investigate before making any statement to Washington and he will report at intervals to the Council.

NOTE FOR IDLE LAWYERS

San Francisco, July 9.—A strong warning that the Federal Government might be compelled to provide legal services for persons who could not pay the present charges of lawyers, came today from Robert H. Jackson, Solicitor General of the United States.

"It has been for centuries thought the duty of government to take affirmative steps to see that its citizens received justice," said the New Deal leader . . .

"The government is already through relief rolls and WPA projects, providing support for a very substantial number of lawyers . . .

"I have grave doubts that society will continue to support idle lawyers and at the same time go without their service once it wakes up to what it is doing.

"Our bar can not claim to be discharging its full duty to society by rendering service that is out of reach of an increasing proportion of our people."

Advising the bar to consider organizing within itself a plan for "low cost, high volume" legal services, the Solicitor General cautioned:

"In default of our attention, this problem will be likely to be forced upon government."

SAVING YOUR REPUTATION

(Monthly Editorial Prepared by the Medical Advisory Committee)

Honesty and sincerity in all dealings with their clientele have paid big dividends in the regard which the public have for their medical advisors. This is shown by the lack of sympathy which accompanied recent attempts to legislate detrimentally to the welfare of the private practitioner in the public thinking and press.

The Medical Advisory Committee has often noted, in checking the suits brought against our membership, that certain localities have many while others have none or very few. Has the attitude of the men towards their patients anything to do with the number? Has the patient-physician responsibility been, to some extent, lost sight of? This is the question which most often comes to one's mind.

In the background of the controversial points, certain things have appeared most plainly in answer. It has often been noted in the evidence presented in court, that not enough time has been spent by the attending physician in discussing the medical or surgical aspects of the findings and treatment, and especially in explaining x-ray films to the patient or the one responsible to represent the patient.

The anxious patient soon senses the possibility that all is not right if the truth is withheld from him. He will make a quicker and better recovery if his morale is built up by the proper psychology. Let the patient follow his case, through your explanations of the why and wherefore of your line of treatment. Surely, knowing the probable outcome, he will share the responsibility with greater fortitude.

It is very disconcerting while on the witness stand to be asked by a lawyer why full knowledge of the condition was not explained to the patient. It is surely much easier to defend one's position if this question cannot be used. A little time and patience used in explanations at the beginning and throughout the case may save a reputation in the end.

B.J.B.

A Place in the Sun

The moment that we get people to living properly we shall see an enormous reduction in disease. One of the most extraordinary things is that the good Lord gives us sunshine and chlorophyll and other things that science talks about and yet when the sun appears man hides himself, and when it disappears he comes out in the open again. God puts His people in the sun and then society comes along and shoves His people back into dungeons and behind bars and in dark rooms—and that is what we call civilization.—Gaha, F., *British Jour. Tuber.*, July, 1937.

OF GENERAL INTEREST

Dr. F. E. Mork of Anoka has purchased the Gates Hospital in that city and is having extensive alterations made. The building will be completely redecorated and modernized and will be known as the Anoka Hospital.

* * *

Dr. and Mrs. R. J. Wilkowske and family, who have made their home in Nerstrand for the past seven years, have moved to Owatonna, where Dr. Wilkowske will be associated in the practice of medicine with Dr. D. E. Morehead.

* * *

Dr. Smith and Miss Mary Elaine Burns, former supervisor of surgery and orthopedics in Saint Mary's Hospital, Minneapolis, were married on September 23, 1939. Mrs. Smith will assist Dr. Smith in his office and operative work.

* * *

Dr. David A. Sher has moved from Cold Spring, where he has been located the past four years, to Austin, Minnesota. Dr. Sher has disposed of his practice at Cold Spring to Dr. Joseph H. Barnett, formerly of Minneapolis.

* * *

Dr. Harold F. Buchstein has returned to Minneapolis and has opened offices at 1837 Medical Arts Building for the practice of neurological surgery. Dr. Buchstein was formerly a fellow on neurosurgery at the Mayo Foundation and more recently Honorary Research Fellow at Yale University.

* * *

Dr. Graham Smith, graduate of the University of Minnesota Medical College and recently identified as interne at Saint Mary's Hospital in Minneapolis, has located at Fulda, Minnesota. Dr. Smith will also be on the consultant staff of the Home Hospital at Slayton.

* * *

Dr. E. Robert Schwartz of Minneapolis has opened offices in Stewartville for the practice of medicine. Dr. Schwartz, a graduate of the University of Minnesota in 1936 was formerly a member of the staff of the Student Health Service at the State University in Kansas.

* * *

Dr. Vernon L. Hart of Minneapolis was awarded the gold medal offered by the Southern Minnesota Medical Association for the best scientific exhibit at the recent meeting of the Minnesoa State Medical Association. His winning exhibit was that of radiographs of unusual fractures.

* * *

Dr. N. F. Musachio, a graduate of the University of Minnesota Medical School, has established himself in practice at Eden Valley. Before going to Eden Valley he spent a year at Saint Mary's Hospital, Duluth, and was associated for a time with Dr. R. T. Healey at Pierz.

Dr. and Mrs. L. Kenneth Onsgard of Houston, Minnesota, returned in August from a European cruise. They visited Iceland, Norway, Sweden, Denmark, Scotland, Holland, England and France. They were in London during the first "black-out" and saw various preparations for war and air raid shelter. During their absence of seven weeks on this cruise, Dr. Onsgard's practice was in charge of Dr. R. E. Weismann. Dr. Onsgard reports that he was called upon to do an emergency appendectomy en route to North Cape, three hundred miles north of the Arctic Circle at midnight, when it was broad daylight outside.

Dr. H. E. Hilleboe of Saint Paul has been named chief of the medical unit of the social welfare division in Minnesota under the Social Security Board. In his present capacity he will continue his former duties as director of the division of services for crippled children and tuberculosis and also will head the work formerly handled by the division of the deaf in the industrial commission. Dr. Hilleboe will serve as consulting medical official in matters of aid to dependent children, old age assistance, and other services in which medical advice is required by the Social Security regulations.

Minnesota Medical Alumni

The Minnesota Medical Alumni Association will meet on October 14, at 9 a. m., in the Eustis Amphitheater of the University Hospital in conjunction with the program for the commemoration of the fiftieth anniversary of the founding of the Medical School.

An unusually fine group of clinics has been arranged by Dr. Wm. A. O'Brien, to be presented by Doctors Adson, Wangensteen, Barnes, McKelvey, Snell, and Watson. This program will be followed by the annual luncheon meeting, compliments of the University Hospital, when the revised constitution will be presented for adoption.

Memorial Pilgrimage to Rochester

In response to the request of many members, the Council of the Minnesota State Medical Association has arranged for a memorial pilgrimage to Rochester, Friday, October 27, 1939. On this occasion, Minnesota physicians will pay tribute to the memory of Dr. Will and Dr. Charlie Mayo. All members of the Association are invited to take part.

Ceremonies will be conducted at Plummer Hall at 3:30 P. M., President George Earl, presiding. Dr. E. L. Tuohy, Duluth, will make the address. At 4 o'clock the visiting physicians will proceed in their cars to Oakwood Cemetery, where wreaths will be placed by Dr. Arnold Schwyzer, Saint Paul, and Dr. Charles W. More, Eveleth. The carillon will be played during the procession and ceremony at the graves.

Physicians Wanted for CCC Duty

While medical service for the Civilian Conservation Corps has in the past been supplied by the medical section of the Officers' Reserve Corps with the exception of a few doctors employed on a contract basis, doctors not on the reserve may now be employed under a rating of civilian employes, or on a contract basis. No quarters for families are provided and the doctor must pay for his food at camps. The initial pay is $2,600 a year.

Those interested should apply to the office of the Surgeon, Headquarters Seventh Corps Area, Federal Building, Omaha, Nebraska.

TRUTH ABOUT MEDICINES
NEW AND NON-OFFICIAL REMEDIES

The following products have been accepted by the Council on Pharmacy and Chemistry of the American Medical Association for inclusion in New and Non-official Remedies:

Mercupurin.—An aqueous solution containing molar equivalent quantities of the sodium salt of B-methoxy-γ-hydroxymercuripropylamide of trimethyl cyclopentane, dicarboxylic acid and of theophylline. Evidence is given that the theophylline in Mercupurin is chemically combined with the mercurial. Mercupurin is a potent diuretic. It is perhaps less toxic and more active than the purine-free mercurial diuretics. It has been demonstrated that when theophylline is combined with the mercurial, sloughs and venous thrombosis occur with less frequency and severity. The drug is effective and well tolerated by intramuscular as well as intravenous administration. Mercupurin is used to remove excess fluid in edema of congestive heart failure, nephrosis, and cirrhosis of the liver with ascites. It is contraindicated in advanced chronic nephritis and acute renal disease. Care should be taken not to restrict the intake of sodium chloride too drastically, as copious diuresis may give rise to the symptoms associated with hypochloremia. The product is marketed in the form of ampules 1 c.c. and 2 c.c. Campbell Products, Inc., New York.

Ampoules Iodobismitol with Saligenin, 2 c.c.—Each ampule contains from 0.115 to 0.133 Gm. of sodium iodobismuthite (equivalent to 0.024 to 0.027 Gm. metallic bismuth) and from 0.218 to 0.258 Gm. of sodium iodide dissolved in propylene glycol containing 4 per cent saligenin and 0.1 per cent glacial acetic acid. Cutter Laboratories, Berkeley, Calif.

Iodobismitol with Saligenin, 50 c.c. Bottle.—Each 2 c.c. contains from 0.115 to 0.133 Gm. of sodium iodobismuthite (equivalent to 0.024 to 0.027 Gm. of metallic bismuth) and from 0.218 to 0.258 Gm. of sodium iodide dissolved in propylene glycol containing 4 per cent saligenin and 0.1 per cent glacial acetic acid. Cutter Laboratories, Berkeley, Calif. (Jour. A.M.A., June 3, 1939, p. 2278.)

Sulfapyridine-Calco.—A brand of sulfapyridine-N.N.R. *(The Journal,* May 6, 1939, p. 1831.) It is supplied in the form of tablets, 0.5 Gm. (7.7 grains). The Calco Chemical Co., Inc., Bound Brook, N. J.

Sulfapyridine-Lederle.—A brand of sulfapyridine-N.N.R. (*The Journal,* May 6, 1939, p. 1831.) It is supplied in the form of tablets, 0.5 Gm. (7.7 grains). Lederle Laboratories, Inc., Pearl River, N. Y.

Sulfapyridine-Merck.—A brand of sulfapyridine-N.N.R. (*The Journal,* May 6, 1939, p. 1831.) It is supplied in the form of tablets, 0.5 Gm. (7.7 grains). Merck & Co., Inc., Rahway, N. J.

Tablets Sulfanilamide, 5 grains-The Upjohn Company.—Each tablet contains sulfanilamide, (New and Non-official Remedies, 1939, p. 463) 5 grains. The Upjohn Company, Kalamazoo, Mich.

REPORTS and ANNOUNCEMENTS

FIFTIETH ANNIVERSARY OF FOUNDING OF THE MEDICAL SCHOOL, UNIVERSITY OF MINNESOTA

Thursday, October 12, 1939

MORNING SESSION, 9:00 O'CLOCK

AUDITORIUM OF MUSIC BUILDING

Theme: *Progress in the Application of Physical Chemistry to Medicine*

Presiding: George E. Fahr,
Professor of Medicine, University of Minnesota

The Colloid Chemistry of Membranes in Living Organisms.

Herbert M. Freundlich, Distinguished Service Professor, University of Minnesota

The Performance of Osmotic Work in Living Systems.

Maurice B. Visscher, Professor of Physiology, University of Minnesota

Some Reactions by Which Solutes May be Differentially Concentrated by the Kidney.

John P. Peters, Professor of Medicine, Yale University

Medical Education, Research, and the Public Health.

Thomas Parran, Jr., Surgeon-General, United States Public Health Service (University Convocation Address, 11:30 a.m., Northrop Auditorium)

LUNCHEON ROUND-TABLE DISCUSSIONS, 12:30 O'CLOCK

MINNESOTA UNION

The Clinical Significance of Water and Electrolyte Balances.

Chairman: Ancel Keys, Professor of Physiology, University of Minnesota
Leader of Discussion: John P. Peters, Professor of Medicine, Yale University

Blood Regeneration in the Anemias.

Chairman: Hal Downey, Professor of Anatomy, University of Minnesota
Leader of Discussion: George H. Whipple, Professor of Pathology and Dean of the Medical School, University of Rochester

Clinical Problems of Thrombosis.

Chairman: Elexious T. Bell, Professor of Pathology, University of Minnesota
Leader of Discussion: Charles H. Best, Professor of Physiology, University of Toronto

Current Trends in Public Health.

Chairman: Gaylord W. Anderson, Professor of Preventive Medicine and Public Health, University of Minnesota
Leader of Discussion: Thomas Parran, Jr., Surgeon-General, United States Public Health Service

AFTERNOON SESSION, 2:30 O'CLOCK

NORTHROP AUDITORIUM

Theme: *Some Recent Investigations in Metabolism*

Presiding: Clarence M. Jackson,
Professor of Anatomy, University of Minnesota

Organic Chemistry in the Pursuit of Vitamin Research.

Lee I. Smith, Professor of Organic Chemistry, University of Minnesota

Investigations of Metabolism of the Fatty Acids.

George E. Burr, Professor of Physiological Chemistry, University of Minnesota

Production, Utilization and Significance of Blood Proteins. (Annual Lecture of the Minnesota Pathological Society.)

George H. Whipple, Professor of Pathology and Dean of the Medical School, University of Rochester

Investigations Concerning the Problem of Thrombosis.

Charles H. Best, Professor of Physiology, University of Toronto

EVENING SESSION, 8:00 O'CLOCK

NORTHROP AUDITORIUM

Presiding: Harold S. Diehl,
Dean of the Medical Sciences, University of Minnesota

Medicine and the Commonwealth.

The Honorable Harold E. Stassen, Governor of the State of Minnesota

The Place of Medicine in a University.

Guy Stanton Ford, President, University of Minnesota

The Rôle of the Fundamental Sciences in Medical Progress. (The first Elias Potter Lyon Lecture.)

Anton J. Carlson, Distinguished Service Professor of Physiology, University of Chicago

Friday, October 13, 1939

MORNING SESSION, 9:00 O'CLOCK

NORTHROP AUDITORIUM

Theme: *Some Aspects of Immunity and Chemotherapy*

Presiding: Winford P. Larson,
Professor of Bacteriology, University of Minnesota

Microbic Respiration.

A. J. Kluyver, Professor of Microbiology, Delft, Holland

The Biology of Animal Virus Diseases.

Robert G. Green, Professor of Bacteriology, University of Minnesota

Observations Upon the Mode of Action of Sulfanilamide and Its Derivatives.

Perrin H. Long, Associate Professor of Medicine, Johns Hopkins University

Chemistry in Urinary Antisepsis.

Henry F. Helmholz, Professor of Pediatrics, The Mayo Foundation, University of Minnesota

LUNCHEON ROUND-TABLE DISCUSSIONS, 12:00 O'CLOCK

MINNESOTA UNION

Chemotherapy.

Chairman: Arthur D. Hirschfelder, Professor of Pharmacology, University of Minnesota
Leader of Discussion: Perrin H. Long, Associate Professor of Medicine, Johns Hopkins University

Clinical Aspects of the Vegetative Nervous System.

Chairman: Frank C. Mann, Professor of Experimental Medicine, The Mayo Foundation, University of Minnesota
Leader of Discussion: Walter B. Cannon, Professor of Physiology, Harvard University

Clinical Physiology of the Gastro-Intestinal Tract.

Chairman: Owen H. Wangensteen, Professor of Surgery, University of Minnesota
Leader of Discussion: Anton J. Carlson, Distinguished Service Professor of Physiology, University of Chicago

Neurophysiology.

Chairman: J. Charnley McKinley, Professor of Nervous and Mental Diseases, University of Minnesota
Leaders of Discussion: Detlev W. Bronk, Professor and Director, Institute of Neurology, University of Pennsylvania; Herbert S. Gasser, Director, Rockefeller Institute for Medical Research

Recent Advances in Bacteriology.

Chairman: A. T. Henrici, Professor of Bacteriology, University of Minnesota
Leader of Discussion: A. J. Kluyver, Professor of Microbiology, Delft, Holland

AFTERNOON SESSION, 2:00 O'CLOCK

AUDITORIUM OF MUSIC BUILDING

Theme: *Some Approaches to the Nervous Control of the Organism*

Presiding: Andrew T. Rasmussen,
Professor of Neuro-Anatomy, University of Minnesota

The Chemical Approach to the Problem of Convulsive Mechanisms.

Irvine McQuarrie, Professor of Pediatrics, University of Minnesota

Methods of Analysis of Nervous Action.

Herbert S. Gasser, Director, Rockefeller Institute for Medical Research

The Nervous System in the Regulation of Visceral Processes.

Detlev W. Bronk, Professor and Director, Institute of Neurology, University of Pennsylvania

The Argument for Chemical Mediation of Nerve Impulses (The Annual Alpha Omega Alpha Lecture.)

Walter B. Cannon, Professor of Physiology, Harvard University

EVENING SESSION, 6:30 O'CLOCK

BALLROOM, MINNESOTA UNION

Presiding: Harold S. Diehl,
Dean of the Medical Sciences, University of Minnesota

The Medical School of the University of Minnesota in Retrospect and Prospect.

Harold S. Diehl, Dean of the Medical Sciences, University of Minnesota

The Medical School from the Point of View of the Alumni. (The Herman M. Johnson Lecture of the Minnesota State Medical Association.)

Olaf J. Hagen, Class of 1906, Moorhead, Minnesota

Graduate Medical Education.

Donald C. Balfour, Director, The Mayo Foundation, University of Minnesota

Presentation of Distinguished Service Award of Minnesota State Medical Association Posthumously to Dr. William J. Mayo, Dr. Charles H. Mayo, and Dr. Herman M. Johnson.

George Earl, President of the Minnesota State Medical Association

Progress in Medical Education on the American Scene.

Richard E. Scammon, Distinguished Service Professor, University of Minnesota

Saturday, October 14, 1939

MORNING SESSION, 9:00 O'CLOCK

EUSTIS AMPHITHEATER, UNIVERSITY HOSPITAL

Anniversary Clinics

Presiding: William A. O'Brien,
Director, Postgraduate Medical Education, University of Minnesota

The Surgical Consideration of Essential Hypertension.

Alfred W. Adson, Professor of Neurosurgery, The Mayo Foundation, University of Minnesota

A Physiological and Surgical Critique of the Surgeon's Rôle in the Management of Peptic Ulcer.

Owen H. Wangensteen, Professor of Surgery, University of Minnesota

Certain Physiologic Concepts Important in the Practice of Cardiology.

Arlie R. Barnes, Professor of Medicine, The Mayo Foundation, University of Minnesota

Some Disturbances of the Vascular System in Pregnancy.

John L. McKelvey, Professor of Obstetrics and Gynecology, University of Minnesota

Sprue and Related Diseases Affecting Intestinal Absorption.

Albert M. Snell, Associate Professor of Medicine, The Mayo Foundation, University of Minnesota

Jaundice Due to Cancer.

Cecil J. Watson, Associate Professor of Medicine, University of Minnesota

NOTE: On October 16 to 21 the School of Nursing of the University of Minnesota will celebrate the Thirtieth Anniversary of its establishment. An Institute on Nursing Administration and Education will be held in the Center for Continuation Study. A series of exhibits, special demonstrations and conferences will be conducted in the hospitals, and Miss Isabel M. Stewart of Teachers College, Columbia University, will deliver the Richard Olding Beard Lectureship address.

MINNEAPOLIS SURGICAL SOCIETY

The first meeting of the year of the Minneapolis Surgical Society will be a dinner meeting, October 5, at the Minneapolis Athletic Club. Dr. Arthur R. Metz, past president of the Chicago Surgical Society, will present a paper and show a movie taken while accompanying an extensive hunting expedition into Africa.

WABASHA COUNTY SOCIETY

The seventy-first annual meeting of the Wabasha County Medical Society will be held at Lake City, Minnesota, Thursday, October 5, 1939. The business session will be held in the City Hall at 4:30 p.m., with dinner at the Blue Moon Cafe at 6:30 p.m. The Scientific Session, which will be held in the City Hall, immediately after the dinner, will include the following papers:

President's Address—"Malaria With Case Report," Dr. B. J. Bouquet, Wabasha.

"Tetanus and Its Prevention," with Report of a Case from Wabasha County, Dr. P. H. Heersema, Mayo Clinic.

"Surgical Drainage of the Abdomen," Lantern slide illustrations, Dr. R. A. Glabe, Plainview.

"Urologic Pathologic Museum," Picture Demonstration, Dr. W. E. Bannen, La Crosse, Wis.

Entertainment for the ladies will be provided by the local doctors' wives.

Officers of the Society are: President, Dr. B. J. Bouquet, Wabasha; vice president, Dr. E. W. Ellis, Elgin; secretary, Dr. W. F. Wilson, Lake City.

WASHINGTON COUNTY SOCIETY

The Washington County Medical Society held its regular monthly meeting September 12. The guest speaker, Dr. Robert M. Burns, Saint Paul, took for his subject: "Accidents in Homes and Industries" and the several degrees of disability following same. He used charts prepared by Dr. Chesley covering this state, and presented much information on the subject from other sources.

The doctor also spoke on the difficulty of estimating the time of probable recovery and the degree of disability from accidents whether complete, partial or permanent, and showed charts of insurance companies' estimates. The subject was well presented.

The meeting was attended by Dr. Sherman of Bayport, and Dr. Stella Wilkinson of Newport.

BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

BOOKS RECEIVED FOR REVIEW

Treatment in General Practice. The Management of Some Major Medical Disorders. A series of articles by various authors. 2 Vols. First published in England, Vol. 1 in March, 1936, and Vol. 2 in November, 1936. Vol. 1, 259 pages; Vol. 2, 436 pages. Illus. Price, $7.50, cloth. Boston: Little, Brown & Co., 1939.

Diseases of the Skin. Tenth Edition. Richard L. Sutton, M.D., Sc.D., LL.D., F.R.S. (Edin.), Professor of Dermatology, University of Kansas School of Medicine; and Richard L. Sutton, Jr., A. M., M.D., L.R.C.P. (Edin.) Associate in Dermatology, University of Kansas School of Medicine 1549 pages. Illus. Price, $15.00, cloth. St. Louis, C. V. Mosby Co., 1939.

Eye, Ear Nose and Throat Manual for Nurses. Fourth Edition. Roy H. Parkinson, M.D., F.A.C.S. Head Oculist and Aurist to St. Joseph's Hospital, San Francisco, Calif. 243 pages. Illus. Price, $2.25, cloth. St. Louis: C. V. Mosby Co., 1939.

Microbiology and Pathology. Second Edition. Charles F. Carter, B.S., M.D. Director of Carters Clinical Laboratory, Dallas, Texas; Consulting Pathologist, St. Louis Southwestern Ry. Hospital, Texarkana, Arkansas; Consulting Pathologist, Mother Francis Hospital, Tyler, Texas, etc., etc. 755 pages. Illus. Price, $3.25, cloth. St. Louis: C. V. Mosby, Co., 1939.

Symposium on the Synapse. Reprinted from Journal of Neurophysiology, 1939. Herbert S. Gasser, Joseph Erlanger, Detlev W. Bronk, Rafael Lorente De Nó, and Alexander Forbes. 74 pages. Illus. Cloth binding. Springfield, Ill.: Charles C. Thomas, 1939.

Office Gynecology. J. P. Greenhill, B.S., M.D., F.A.C.S. Professor of Obstetrics and Gynecology, Loyola University Medical School, Chicago; Professor of Gynecology, Cook County Graduate School of Medicine; attending gynecologist Cook County Hospital; editor of "Gynecology" in the Year Book of Obstetrics and Gynecology; author of "Obstetrics for the General Practitioner." 406 pages. Illus. Price, $3.00, cloth. Chicago: The Year Book Publishers, 1939.

NEW AND NONOFFICIAL REMEDIES, 1939. Containing descriptions of the articles which stand accepted by the Council on Pharmacy and Chemistry of the American Medical Association on Jan. 1, 1939. Cloth. Price, postpaid, $1.50. Pp. 617. Chicago: American Medical Association, 1939.

Each year a revised list of the articles which stand accepted by the Council on Pharmacy and Chemistry of the American Medical Association as of January first is published in book form under the title of "New and Nonofficial Remedies." The book contains the descriptions of acceptable proprietary substances and their preparations, proprietary mixtures if they have originality or other important qualities, important nonproprietary nonofficial articles, simple pharmaceutical

A CONVENIENT OFFICE TREATMENT FOR TRICHOMONAS VAGINITIS

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THIS simple treatment requires but two office visits, a week apart, for insufflations and the nightly insertion of a Silver Picrate suppository for twelve nights.

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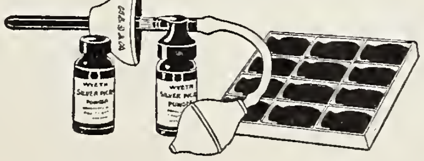

JOHN WYETH & BROTHER, INCORPORATED, Philadelphia, Pa.

preparations, and other articles which require retention in the book.

A list of articles and brands accepted by the Council, but not described, is included in the book to cover simple preparations or mixtures of official articles (U.S.P. or N.F.) marketed under descriptive, nonproprietary names for which only established claims are made. Diagnostic reagents which are not used in or on the human body, and protein diagnostic preparations are not included in New and Nonofficial Remedies unless the determination of the status of these products by the Council has been requested by the distributor: If such products are found to be marketed in accordance with the Council's rules, they may be included in the list of undescribed, but acceptable articles.

A supplement to the annual volume of New and Nonofficial Remedies is published twice a year to bring up to date such current revisions and additions as have been necessary since its last publication. Every product included in the book is subject to the official rules of the Council. The comments to rules are changed occasionally by way of clarifying interpretation to insure fair consideration of all submitted preparations as new standards are recognized. Such constant and critical consideration of its contents provides the physician with a valuable reference list of acceptable new preparations on which to base his selection for use in treatment according to the established current practices of the profession.

New and Nonofficial Remedies for 1939 omits many articles which appeared in the publication for 1938. A few of these have been omitted by action of the Council because they conflict with the rules that govern the recognition of articles or because their distributors did not present convincing evidence to demonstrate their continued eligibility. Among these are: Biliposol, Serobacterins and Suppositories Salyrgan. A considerable number of others have been omitted as being off the market.

The 1939 New and Nonofficial Remedies, of course, contains the revisions which appeared in the supplements for the 1938 edition, and continues the plan of grouping together articles having similar composition or action under a general discussion. These discussions have undergone considerable revision in the 1939 edition. Further revision of statements regarding the actions, uses, dosage, composition, purity, identity, strength or physical properties of many of the articles has also been necessary in some cases. Noteworthy revisions are: Anesthetics, Local, Bismuth, Compounds, Organs of Animals; Vitamins and Vitamin Preparations and Liver and Stomach Preparations.

The indices of the new volume of New and Nonofficial Remedies are of the same order and plan as in previous editions. A general index lists accepted articles, including those not described. This is followed by an index to distributors in which appear all the Council accepted articles listed under their respective manufacturers. Finally, a bibliographical index is added for listing proprietary and unofficial articles not included in N.N.R. This includes references to the Council publications concerning each such article as has appeared in *The Journal of the A.M.A.*, Reports of the Council on Pharmacy and Chemistry, Propaganda for Reform, Vol. 1 and 2, or Reports of the A.M.A. Chemical Laboratory.

PRINCIPLES OF CHEMISTRY. Fifth Edition. Joseph H. Roe, Ph.D., Professor of Biochemistry, School of Medicine, George Washington University; formerly Instructor in Chemistry, Central School of Nursing, Washington, D. C. 503 pages. Illus. Price, $3.00, cloth. St. Louis: C. V. Mosby Co., 1939.

This book purports to be a text for the training of student nurses. It aims to present the essentials of both inorganic and organic chemistry as factors in human physiology.

The reviewer has no hesitancy in acknowledging this book as a fine and unique work. Its use as a text for student nurses requires careful selection by the instructor of such portions as the limited time, facilities, and local nursing standards indicate. For the nurse it is a good conservative reference book; for the physician, a nice piece of ground upon which to keep one foot.

R. L. N.

AN INTRODUCTION TO SOCIOLOGY AND SOCIAL PROBLEMS. By Deborah MacLurg Jensen, R.N., B.Sc. Cloth. Price $2.75. 341 pages. St. Louis: C. V. Mosby Co., 1939.

Due to the brief time allotted to the subjects of Sociology and Social Problems in the nursing curriculum, the author has purposely divested her book of detail and amplification in order to give a clear and comprehensive picture of the fields. Little original though is displayed; rather, the material is a compilation of the best recognized sources available.

The most significant feature of this book is Mrs. Jensen's stress on the importance of the nurse's studying the *whole* patient as well as expertly carrying out technical procedures. "This implies," says Mrs. Jensen, "that she (the nurse) must study each of her patients and try to appreciate the background and experiences out of which his present attitudes became fixed. She needs to be aware, not only of the medical and nursing problems associated with this patient and the disease, but also to recognize the social problems which have developed or become accentuated because of the disease situation."

The nurse can well profit by incorporating this point of view into her professional ethics. Her horizons will be broadened to include not only the physically and mentally handicapped, but also the socially handicapped as well. This book is written with the hope that nurses will develop a broad and objective viewpoint to social problems and to see their close interrelationship with illness and health situations.

M. L. Zlatovski, M.D.

MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

Volume 22 NOVEMBER, 1939 No. 11

THE DIAGNOSIS AND TREATMENT OF ACUTE APPENDICITIS AND ITS COMPLICATIONS*

NEIL LEITCH, A.B., B.Sc., M.D., F.A.C.S.
Warroad, Minnesota

THERE is no need of apologizing for bringing up a discussion on appendicitis, for this condition is responsible for the major portion of our emergency abdominal surgery. John B. Murphy expressed himself on this subject years ago, as follows: "Is it time to stop talking about appendicitis? No! It is just the time to begin talking about it and talk about it most seriously and emphatically!"

The archives are filled with reports on far larger groups of cases than mine. What I have to say about the diagnosis and treatment of acute appendicitis will be told in as few words as possible. No attempt will be made to simulate a textbook presentation of this subject and my remarks will be based almost entirely on an experience with 233 consecutive operations for appendicitis over a period of approximately eleven years.

Diagnosis

The patient typically presents himself, or herself, for examination either in bed at home or by limping into the office or hospital. On being asked, "What is the chief complaint?" the patient complains of stomach ache, cramps, or pain in the side. The duration of this symptom is from a few hours to four or five days. There is frequently nausea or vomiting, especially in complicated cases, and in children these symptoms may be more pronounced. The number of times vomiting occurs usually depends upon the number of times food or water has been attempted. Cathartics are frequently taken and they invariably create an exacerbation of the pain. The stomach ache or cramps start in the center of the abdomen, about the umbilicus or epigastrium and shift to the lower right quadrant in eight to twelve hours. The right thigh may be slightly flexed. Constipation is the general rule, but occasionally there is diarrhea. The temperature may be only slightly elevated and varies from 99 to 101 as a general rule, although perforation may be followed by a subnormal and later complications by a much higher temperature. The pulse is slightly elevated to 90 or 100 per minute. The leukocyte count should be well over 12,000 in an acute suppurative case.

Physical examination should begin with palpation of the left lower quadrant and working around the abdomen counter clockwise until the lower right quadrant is reached, using first gentle and then deeper pressure. In a typical case the tenderness will increase as one approaches McBurney's point in the lower right quadrant. Pressure over this area usually causes the patient to squirm and exclaim with pain. In cases where there is an atypical position of the appendix, the maximum point of tenderness may be at the outer side of the right loin in the case of a retrocecal appendix, or in the pelvis if it hangs over the pelvic brim. In these latter cases vaginal or rectal examination is quite often necessary in order to reveal the tender area, while in cases where the appendix points medially and to the back of the abdomen and lies under the mesentery of the ileum, deep palpation is necessary to elicit the typical tender area. Flexing the right thigh on the abdomen while extending the lower leg is a valuable maneuver where a deep seated appendix may be lying near the psoas muscle. Rebound tenderness and hyperesthesia of the skin are less valuable signs. Muscular rigidity in the lower quadrant will be present, especially if there is any amount of periappendicitis. Perforation is accompanied by a more general extension of tenderness over the lower abdomen and there is a definite decrease in pain for a time until peritonitis sets in, when there is increasing distention and pain with a recurrence of vomiting. An appendiceal abscess gives a sensation of rather firm, solid resistance on palpation and is accompanied by a longer history. I have never seen a case of left sided appendix. The urine should show no pus cells. However, if the above syndrome is typical, I should prefer to operate immediately, even though there are a few pus cells in the urine.

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*Read before Red River Valley Medical Society, October 11, 1938.

One is frequently called upon to rule out one or more of the following diseases:

1. In *salpingitis* one may have a history of neisserian infection. The tenderness is lower down, both sides of the lower abdomen are tender and on vaginal examination there is far more tenderness on moving the cervix. Vaginal discharge and the Gram-negative diplococci are usually present in the secretion of the cervix.

2. In *ectopic pregnancy* there is usually a history of a missed period and spotting. Palpation discloses a mass and extreme tenderness on vaginal examination. Pallor and quickened pulse are additional valuable signs in ruptured cases.

3. *Intestinal obstruction* has a more abrupt onset, more frequent vomiting with absence of stool and flatus from the rectum. The abdominal tenderness is more generalized and the pain more severe.

4. *Gallstone colic* is accompanied by a history of dyspepsia, gas and possibly jaundice. The pain and tenderness are in the upper abdomen and referred to the shoulder. The vomiting is more frequent.

5. In *perforated peptic ulcer* one may find a typical ulcer history. The onset is more sudden, the rigidity of the entire abdomen is "board-like" and the pain steady. Also there is decreased liver dullness and a gas bubble below the diaphragm.

6. *Renal colic* is associated with frequency of urination and possibly blood or pus in the urine. The pain radiates down to the genital organs or thigh and a flat plate of kidney, ureters and bladder is apt to show a shadow in the renal pelvis or along the course of the ureter.

7. *Ovarian lesions,* such as a twisted ovarian cyst, can usually be detected by vaginal examination, while a ruptured lutein cyst may be difficult to rule out except when there are signs of hemorrhage present, when it simulates the picture of ruptured ectopic pregnancy.

8. *Pyelitis, hydronephrosis and renal tumors* are eliminated by urine examination and pyelography, as well as palpation.

9. A *spastic bowel* gives a fairly typical history of generalized colicky pain over a long period of time, with frequent bowel movements or passage of gas by rectum.

10. *Mesenteric thrombosis* is characterized by a sudden onset of most severe pain. The temperature may be high and blood is vomited later. The tenderness is more generalized.

11. Acute infectious diseases such as pneumonia in children, measles, scarlet fever and influenza may be ruled out by history of exposure, examination of chest and mouth, as well as the leukocyte count.

12. *Acute pancreatitis* is characterized by a rapid onset, extremely rapid pulse, frequent vomiting and collapse. The tenderness is higher in the abdomen than in a case of appendicitis.

13. *Tabes dorsalis* gives the typical neurological findings of frozen pupils, absent knee jerks and possible history of primary lesion with a genital scar.

14. *Inflammation of Meckel's diverticulum* is not usually diagnosed until operation.

15. *Appendiceal neurosis.* There are some patients who may be said to be "appendicitis minded." The only way to surely eliminate these cases from the operative group is, when suspected, to engage them in conversation and palpate the abdomen at the same time. If one is fortunate enough to interest them deeply in some other subject, the typical tenderness is absent.

I have refrained from mentioning the value of the leukocyte count in these differential diseases, as in borderline cases it is misleading, except in those cases accompanied by a leukopenia.

Treatment

The only treatment to consider in the first three days of acute appendicitis is appendectomy. After this time one must individualize cases and put the majority of them on the Ochsner treatment until the inflammatory lesion clears up or an abscess forms. I see fewer of these late cases now than ten years ago and have treated at least a dozen or more of them in this manner with no mortality. Some of them came to operation later and are reported in this group, but those which cleared up are not included.

Once operation is decided upon, this is best done as soon as possible and may be performed under ether, ethylene gas, chloroform, local infiltration or subarachnoid block. My preference is for ether or subarachnoid block. I believe it makes very little difference which of these two methods is used as long as the cases are well selected and the method used adapted to the patient. Preparation is made by giving an enema, unless perforation is suspected. A preliminary hypnotic of morphine sulphate gr. 1/6 to ¼ and atrophine sulphate gr. 1/150, if ether is to be used, is given and the skin on the operative site shaved and cleansed with tincture of green soap. In the operating room two applications of Tr. merthiolate (1:1,000) are given to the skin. The operative area is surrounded with sterile towels. I use McBurney's incision in all cases diagnosed as acute appendicitis. The abdomen is opened through this muscle-splitting incision, being careful to cover the wound edges with sterile towels fastened on by Backus towel clips. On opening the peritoneum a pair of ribbon retractors are used to give additional exposure. The cecum is picked up by the aid of a gauze sponge and pulled up until the base of the appendix is exposed, or if bound down the finger of the gloved hand is used to gently separate the adherent organ. At times these adhering bonds are so resistant to blunt dissection that one must sever them by scalpel or scissors, being careful to control any bleeding by clamp and ligature. Other times one had best remove the organ in reverse manner, first clamping, ligating, cutting and inverting the stump, then at the same time proceeding toward the tip to clamp the blood supply of the meso-appendix and working down dissecting adherent structures. In a typical case, the meso-appendix is first ligated with chromic No. 1 catgut. The base of the appendix next the cecum is crushed and ligated with chromic No. 1 catgut. A purse-string suture of gastro-intestinal No. 0 chromic catgut is then inserted in the cecum about the base of the appendix. The diameter of this purse-string, from one side to the other, should be about the size of a penny to that of a nickel. After inserting the purse-string suture, a clamp is placed a safe distance above this ligature and the appendix severed about ⅛ inch above the ligature. The cecum is held in place by the finger tips at the same time. The stump is treated with carbolic acid and alcohol, inverted with an appendix tucker and the purse-string drawn tight and tied. In addition to the purse-string suture an N suture is placed in the cecum to further invert the stump and guard against a "blow-out." There are occasional cases in which the cecum is so friable and thickened that an N suture is used to invert the stump instead of a purse-string. A second ligature is then placed about the meso-appendix, using the remaining ends of the N suture. The meso-appendix is pulled up over the buried stump, giving additional insurance against a "blow-out," as well as doubly insuring hemostasis of the meso-appendix. There are occasional cases where, due to a short meso-appendix, this cannot be done. Any blood or exudate is carefully mopped out of the peritoneal cavity, attending carefully to hemostasis. Also in those cases which are ruptured or accompanied by a purulent exudate, the pelvis and right hepatic fossa are carefully mopped free of any collection of pus and a hot wet laparotomy sponge is placed in the intra-abdominal operative field for one to two minutes. In the cases where one wishes to drain, the tubes are now placed in the pelvis, to the stump of the appendix or the right subhepatic space. The hands are now carefully cleansed and the peritoneum closed with chromic No. 1 catgut, plain interrupted catgut sutures in the muscle and the fascia with chromic No. 2 continuous catgut. Interrupted silkworm gut sutures are placed in the skin and the wound cleansed with 1:1000 solution merthiolate, then covered with gauze.

The manner of placing and type of drain is rather important. I drain most cases which are perforated or accompanied with a large collection of purulent exudate in the pelvis or subhepatic space, at times using two drains. When the exudate is thick, a split rubber tube is used, and, if thin, a soft cigarette drain, these drains being placed in such a manner as to lie between the coils of intestine, cecum and the parietal peritoneum of the lateral abdominal wall. A cigarette drain is removed in two or three days and a split rubber tube in four or five days.

In the case of a localized abscess the appendix is not sought. The abscess is emptied, the cavity explored, a split rubber tube or two placed in the same and the abdominal wall closed loosely about the drains, which are stitched in place and then removed in five to seven days.

After the operation, in the case of simple acute appendicitis, the patient is placed in bed in the recumbent position. In cases of extensive peritonitis accompanied by a large amount of purulent exudate, they are placed in Fowler's position after recovering from the anesthesia. Rinsing the mouth with water is allowed on the first day, sips of water on the second, light liquid and liquid diet on the third and fourth day, soft diet from the fifth to the eighth postoperative days and regular diet on the eighth, on which day the patient is allowed out of bed. A soapsuds enema is given routinely on the third postoperative day and on alternate days from then on, unless bowel movement occurs normally. No cathartics are allowed for at least two weeks after operation. The stitches are removed on the seventh postoperative day. In case of appendiceal abscess, hot wet packs are used routinely.

Distention, due to paralytic ileus, is treated by withholding oral intake of water and food, using also physostigmine sulphate gr. 1/100 by hypo, turpentine enemata, pituitrin (surgical) by hypo, rectal tube, and turpentine stupes to the abdomen. Dextrose and saline solutions are used intravenously if the patient seems dehydrated, as in cases where nausea and vomiting persist, or where peritonitis seems to be advancing. However, this is not used in routine cases. Jejunostomy was used in one case where advanced generalized peritonitis occurred. It was quite efficient. This was before the advent of the Wangensteen tube. I have not as yet had the occasion to use the latter in appendicitis. Morphine sulphate, gr. 1/6 to ¼, by hypo, is used during the first few days.

Secondary abdominal abscesses may occur and these should be carefully looked for in any case where a week or so after the operation there is an increased pain and elevation of temperature. When well localized with the assistance of hot wet packs, these may be opened and drained through the abdominal wall, rectum or vagina under local infiltration or general anesthesia.

Thrombophlebitis of the leg is treated by elevation, rest and ice bag for two or three weeks until the clot becomes organized. Pneumonia is treated in the routine manner of any bronchopneumonia with especial attention to fluid intake. I have had no cases of hepatic abscess or pylephlebitis. Patients with cardiac decompensation may be given digitalis by injection if necessary. Fecal fistulæ should clear up spontaneously. I have had only one such complication and this closed rapidly on a low residue diet.

Patients are discharged from the hospital on the tenth postoperative day, except in case of drainage, when they are retained until all drainage ceases. In uncomplicated cases they are allowed light work in two or three weeks after operation and regular work in a month.

Following the above outlined method of treatment, 233 consecutive operations for appendicitis have been performed over an eleven-year period. I have used the following classification according to gross pathology. Chronic includes those cases in which the lumen is obliterated partially or the walls markedly thickened. Fecaliths may or may not be present. Subacute includes those cases of simple hyperemia of the outside of the appendix without swelling or free pus in the lumen. Acute catarrhal applies to those cases showing swelling of the walls and plastic exudate on the outside, with a small amount of free pus in the lumen. Acute suppurative are those cases in which the organ is swollen, covered with plastic exudate and the lumen filled with pus. This type is frequently associated with a fecalith. A gangrenous appendix is swollen, is accompanied by some plastic exudate and the walls are green or greenish black in color. These always seem to be accompanied by a fecalith, which assists in causing the obstruction of circulation. Ruptured cases include those with any or all of the above changes, in which there is a hole in the wall of the appendix visible to the naked eye. Appendiceal abscess is also included in this group. The accompanying figures give the number of cases in each group, with the number of deaths and the mortality rates.

It will be seen from this that there were 149 cases of acute catarrhal, suppurative, gangrenous and ruptured appendicitis, with one death, being a mortality rate of .67 per cent in this group, which includes all complicated and uncomplicated acute cases. The one death was a case of walled-off abscess located in the center of the abdomen in the retroperitoneal space and cov-

Group	No. Cases	Deaths	Per cent
Chronic and subacute	84	0	0
Acute catarrhal, suppurative and gangrenous	108	0	0
Acute ruptured and abscess	41	1	2.4
TOTAL CASES	233	1	.4

ered in front by coils of intestines. This abscess was successfully drained without the incidence of peritonitis. During the second month of his postoperative course, however, he developed an intractable diarrhea, apparently from ulceration of the abscess into the bowel, draining pus by the rectum. The diarrhea could not be controlled and in spite of blood transfusion and other therapy he died approximately two months after operation.

Conclusions

1. A rather low mortality rate was experienced in a small group of cases of complicated and uncomplicated acute appendicitis.
2. The classification of those cases for operation and those for Ochsner treatment seems to be rather important.
3. Extreme care in regard to selection and placing of drains may, to some extent, assist in lowering mortality rates.
4. A careful and conservative postoperative diet may also assist in lowering the mortality rate.
5. The McBurney incision is the ideal incision for acute appendicitis, especially if drainage is anticipated.
6. Reinforcement of the purse-string suture by an additional N suture may be of some value in prevention of postoperative "blow-outs" of the inverted stump.

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EXTREME CARDIAC HYPERTROPHY*

A Report of Forty-four Cases in Which the Heart Weighed 800 Gm. or More

EDWARD C. ROSENOW, JR., M.D., and HARRY L. SMITH, M.D.
Rochester, Minnesota

THE causes of moderate cardiac hypertrophy are rather well known, but the more common causes of enormous cardiac enlargement are not fully appreciated by most physicians. This study was undertaken to determine the most common causes of extreme cardiac hypertrophy.

Material

The material for this study consisted of clinical and postmortem records of forty-four cases in which the heart weighed 800 gm. or more. The hearts were weighed after they were removed from the body in the usual manner. The large vessels were cut at the base of the heart, which was opened and washed free of blood clots. There were four cases in which the heart weighed between 790 and 800 gm. These were included because we felt that the technical errors in removing the organ would make the weight vary at least 10 gm.

The estimated weight of the normal heart for any patient of a known weight was obtained by multiplying the body weight in grams by 0.43 if the patient was a man and by 0.40 if the patient was a woman, or by multiplying the body weight in pounds by 1.96 if the patient was a man and by 1.8 if the patient was a woman. The latter formula, which was devised by one of us

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*Fellow in Medicine, The Mayo Foundation (Rosenow) and the Section on Cardiology, The Mayo Clinic (Smith), Rochester, Minnesota.

TABLE I. CLINICAL DATA IN TWENTY CASES IN WHICH ENLARGEMENT OF THE HEART RESULTED FROM HYPERTENSION

Age, yrs.	Sex	Height, inches	Body weight, lbs.			Heart weight, gm.			Coronary sclerosis, grade
			Actual	Estimated normal	Over-weight	Actual	Estimated normal*	Over-weight	
46	M	75	213	203	10	1100	417	683	
50	M	67	170	156	14	870	333	537	
62	M	68	178	163	15	852	353	499	3
63	M	71	225	178	47	842	441	401	
54	F	67	219	158	61	838	394	444	
57	M	70	226	173	53	827	441	386	
64	M	67	180	158	22	825	353	472	2
64	M	71	200	178	22	825	392	433	
47	M	70	235	169	66	820	461	359	
56	M	70	200	173	27	815	392	423	3
40	M	65	200	145	55	810	392	418	
49	M	63	165	141	24	810	323	487	
63	M	65	280	149	131	807	549	258	
66	M	65	175	149	26	805	343	462	4
56	M	73	175	191	16**	800	343	457	
51	M	68	200	162	38	800	392	408	
58	M	70	200	173	27	800	392	408	3
56	M	?	235	?	?	795	461	334	
46	M	65	160	148	12	795	313	482	
42	M	70	175	169	6	793	343	450	

*Male: Body weight in pounds x 1.96.
Female: Body weight in pounds x 1.8.

**Underweight.

us (Smith),[4] will give the calculated normal weight of the heart in grams. These formulas are accurate if the patients are of normal weight, but they do not hold for patients who are greatly overweight. It has never been proved accurately just how much the heart of a very obese person should weigh.

The forty-four cases can be divided into three main groups, according to the clinical diagnosis: cases of hypertension, cases of chronic endocarditis, and a miscellaneous group of cases. There were twenty cases in which a diagnosis of hypertension was made and fifteen cases in which the principal diagnosis was chronic rheumatic endocarditis with deformed heart valves. In the miscellaneous group there were two cases in which nothing was found to explain the enormous cardiac hypertrophy except extreme obesity. Two patients had syphilitic aortitis with aortic insufficiency, one patient had a very unusual congenital patent foramen ovale,[1] three patients had severe coronary sclerosis, and one had an adenomatous goiter with hyperthyroidism.

In the twenty cases of hypertension nineteen of the patients were men and one was a woman (Table I). The oldest patient in this group was sixty-six years and the youngest was forty years, the average age being 54.5 years. The largest patient in this group weighed 280 pounds (127 kg.) and the smallest 160 pounds (72.6 kg.); the average weight of these patients was 200½ pounds (90.9 kg.). The largest heart in the cases of hypertension weighed 1100 gm., the smallest weighed 793 gm., and the average weight of the heart was 831.4 gm.

In the fifteen cases of chronic endocarditis all of the patients were men (Table II). The

TABLE II. CLINICAL DATA IN FIFTEEN CASES IN WHICH ENLARGEMENT OF THE HEART RESULTED FROM CHRONIC ENDOCARDITIS

Age, Years	Sex	Height, inches	Body weight, lbs.			Heart weight, gm.			Diagnosis
			Actual	Estimated normal	Over-weight	Actual	Estimated normal*	Over-weight	
58	M	68	133	163	30**	1170	265	905	Calcified aortic stenosis, chronic adhesive pericarditis, grade 2, and coronary sclerosis, grade 3
40	M	72	200	180	20	1017	392	625	Rheumatic aortic endocarditis, calcified aortic stenosis and mitral insufficiency
62	M	72	160	184	24**	980	313	667	Calcified aortic stenosis
?	M	68	180	?		970	353	617	Calcified aortic stenosis
58	M	68	154	163	9**	960	304	656	Aortic and mitral endocarditis; chronic adhesive pericarditis
30	M	69	180	156	24	950	353	597	Aortic insufficiency; mitral stenosis and adhesive pericarditis
20	M	69	155	148	7	902	304	598	Chronic aortic insufficiency (rheumatic), mitral stenosis and adhesive pericarditis, grade 4
46	M	67	?	156		892			Calcified aortic stenosis
58	M	67	175	158	17	862	343	519	Aortic stenosis and mitral stenosis
30	M	68	250	152	98	832	490	342	Aortic and mitral endocarditis; chronic adhesive pericarditis
45	M	70	235	170	65	820	461	359	Calcified aortic stenosis
45	M	66	165	151	14	820	323	497	Calcified aortic stenosis
64	M	72	214	184	30	820	419	401	Calcified aortic stenosis
38	M	66	160	148	12	792	313	479	Aortic regurgitation
40	M	68	136	136	0	800	265	535	Mitral stenosis and chronic adhesive pericarditis

*Body weight in pounds x 1.96.
**Underweight.

oldest patient in this group was sixty-four years of age, the youngest was twenty years and the average age was 45.3 years. The largest patient in this group weighed 250 pounds (113.4 kg.), the smallest weighed 133 pounds (60.3 kg.), and the average weight for the group was 178.3 pounds (80.8 kg.). The largest heart in this group weighed 1170 gm., the smallest weighed 792 gm., and the average weight of the heart was 905.8 gm.

There were two cases in which we found no cause for the extreme cardiac hypertrophy except the marked obesity (Table III). In one of these cases the patient was a man, aged thirty-three years, whose body weight was 550 pounds (249.4 kg.) and whose heart weighed 929 gm. In the other case the patient was a man, aged sixty years, who weighed 350 pounds (158.7 kg.) and whose heart weighed 922 gm.

There were two men who had syphilitic aortitis with aortic insufficiency. One was fifty-one years of age and weighed 147 pounds (66.7 kg.); his heart weighed 832 gm. The other was sixty-two years of age and weighed 178 pounds (80.7 kg.); his heart weighed 900 gm.

In three cases the diagnosis was coronary sclerosis with myocardial infarction. One patient, who was sixty-nine years of age, had coronary sclerosis, grade 4, with chronic myocardial infarction, and diabetic gangrene. He had undergone four amputations of portions of his feet. There is a possibility that at some previous time he might have had an elevated blood pressure although very little evidence for this assumption

TABLE III. CLINICAL DATA IN NINE CASES IN WHICH ENLARGEMENT OF THE HEART RESULTED FROM VARIOUS CONDITIONS

Age, yrs.	Sex	Height, inches	Body weight, lbs.			Heart weight, gm.		
			Actual	Estimated normal	Over-weight	Actual	Estimated normal*	Over-weight
Obesity								
33	M	72	550	175	375	929	1078	149**
60	M	73	350	191	159	922	686	236
Coronary sclerosis								
?	M	71	190			825	373	452
53	M	70	187	172	15	925	373	552
69	M	?	182			850	353	497
Syphilitic aortitis with aortic insufficiency								
62	M	67	178	158	20	900	353	547
51	M	51	147	137	10	832	274	558
Congenital patent foramen ovale, 10 x 17 cm.								
70	M	69	136	168	32**	880	265	615
Adenomatous goiter with hyperthyroidism								
55	M	70	180	173	7	848	353	495

*Body weight in pounds x 1.96.
**Underweight.

was obtained at necropsy. Of the other two patients who had marked coronary sclerosis, one had an adhesive pericarditis and the other showed evidence of having had chronic diffuse nephritis. In two of the three cases in which a diagnosis of severe coronary sclerosis was made, there were other causes for cardiac enlargement; in one of these cases the patient had chronic adhesive pericarditis and in the other case the patient had chronic diffuse nephritis. This leaves only one case in which nothing was found to explain the cardiac hypertrophy except the coronary sclerosis with infarction. It would seem to us that this alone is hardly an adequate explanation.

There was one patient, a man, aged fifty-five years, who had an adenomatous goiter with hyperthyroidism. There was evidence that he had had congestive heart failure for a long time. It seems somewhat unusual that hyperthyroidism alone should produce the amount of cardiac hypertrophy that was found in this case.

There was one patient, a man, aged seventy years, who had an unusual patent foramen ovale which measured 10 by 17 cm.

Golden and Brams[2] reported thirty-eight cases from the literature and added nine cases of their own; in all of these cases the heart weighed 1000 gm. or more. Some of the thirty-eight cases reported in the literature were published many years ago and the data in some of them were very meager. Chronic aortic endocarditis was probably the most common cause of cardiac enlargement in both series of cases. In many instances there was more than one factor which would account for the cardiac enlargement. Several of the cases which were reported in the early literature were reported before hypertension was well understood and before it was considered an important factor in the production of cardiac hypertrophy; therefore, it is impossible to know the exact rôle that this factor played in the production of cardiac enlargement in these cases.

Probably the largest heart on record is one that was in the museum of St. George's Hos-

TABLE IV. SUMMARY OF CASES IN WHICH HYPERTENSION OR ENDOCARDITIS CAUSED CARDIAC ENLARGEMENT

Hypertension					
Age, years			Body weight, lbs.		
Oldest	Youngest	Average	Largest	Smallest	Average
66	40	54.5	280	160	200.5
Sex			Heart size, gm.		
Males		Females	1100	793	831.4
19		1			
Endocarditis					
Age, years			Body weight, lbs.		
Oldest	Youngest	Average	Largest	Smallest	Average
64	20	45.2	250	120	178.3
Sex			Heart size, gm.		
Males		Females	1170	800	905.8
15		0			

pital, in London. It is rather often referred to in the literature. Sedgwick[3] first referred to this heart in 1854. It was the heart of a middle aged man who had suffered from heart disease for many years, but the details of the heart and case are entirely lacking. This heart is supposed to have weighed 5 pounds (2,272 gm.).

Comment

In this series of forty-four cases of extreme cardiac hypertrophy there was often more than one cause for the enormous cardiac enlargement. In thirteen of the twenty cases of hypertension, obesity was present. In the cases of chronic endocarditis more than one valve was usually involved. There were six instances in which only a single valve was involved, that is, five instances of calcified aortic stenosis and one of aortic regurgitation. In six of the nine cases in which more than one valve was involved, chronic adhesive pericarditis was present.

It is rather interesting to note that the chief causes for extreme cardiac hypertrophy in this group of cases were chronic aortic endocarditis and hypertension, although in many instances added factors, such as chronic pericarditis and obesity, were present. Chronic aortic endocarditis is a more important factor in the production of extreme cardiac enlargement than is hypertension, that is, it produces larger hearts than does hypertension. In the cases of hypertension nineteen of the patients were men and one was a woman. The average age of these patients was 54.5 years, the average body weight was 200½ pounds (90.9 kg.), and the average weight of the heart was 831.4 gm. (Table IV). In the fifteen cases of chronic endocarditis all of the patients were men. Their average age was 45.3 years, the average body weight was 178.3 pounds (80.8 kg.), and the average weight of the heart was 905.8 gm. That is, the patients who had endocarditis were 9.2 years younger than were the patients who had hypertension. The average weight of the patients who had endocarditis was 22.2 pounds (16.3 kg.) less than that of the patients who had hypertension and the average weight of the heart was 74.4 gm. greater in the cases of endocarditis.

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SPONTANEOUS CURE OF ACUTE REGIONAL ENTERITIS

DONALD C. MacKINNON, M.A., M.D.
Minneapolis, Minnesota

IN 1932, Crohn and his co-workers[1] clearly described a clinical and pathological entity termed regional ileitis. Subsequent reports proved that the disease process may involve other parts of the intestine, therefore a more comprehensive term, regional enteritis, has gradually been adopted.

The disease is a non-specific, granulomatous, necrotizing, and cicatrizing inflammatory lesion of the intestinal tract usually involving the terminal ileum, and occurring mainly in young adults. Clinically the disease is characterized by symptoms of peritoneal irritation, increased bowel motility, chronic partial intestinal obstruction, abscess formation, and the development of internal and external fistulous tracts. The course of the disease is usually progressive with remissions and exacerbations, gradually passing from the acute to the chronic stage.

During the past seven years numerous articles have appeared in the literature on the subject of ileitis and considerable knowledge of the chronic stage of the disease has been accumulated. Very little has been written concerning the course and prognosis of the early or acute phase. Undoubtedly, more information will be acquired in the future as the early cases are studied more diligently from the clinical as well as from the roentgenological standpoint.

Crohn[2] states that acute ileitis may run a variable course. Of his eleven patients with acute ileitis, three had a remission of their symptoms, suggesting that a spontaneous cure is possible occasionally. Koster[3] explored six patients with acute ileitis without further surgical interference. These nine patients seem to have done well up to the time of the publications by these authors, though detailed descriptions of their cases were lacking. Likewise, Mixter[4] states that a spontaneous cure may take place, although the definite establishment of this contention has yet to be confirmed by a long period of observation or by pathological demonstration in operatively proved cases.

The following case of regional enteritis involving the terminal segment of the ileum is reported because it represents a spontaneous recession of symptoms in a patient who is well two and one-half years after the onset of the acute phase of the disease. Though the progressive character of the disease to chronicity can not be denied, it is possible that more of the cases in the acute phase of this disease have spontaneous recoveries than is hitherto recognized.

Case Report

The patient, a white man, twenty-one years of age, registered at the Minneapolis General Hospital on November 6, 1936. For two weeks prior to admission he complained of moderately severe, intermittent, crampy abdominal pain referred, primarily, to the right lower quadrant of the abdomen. He also complained of anorexia, nausea, and diarrhea, having two to five loose stools daily. In his past history there was a mild attack of rheumatic fever in 1934.

Physical examination revealed a tall, asthenic, young man with normal physical findings except for the abdomen. The admission temperature, pulse, respirations, and blood pressure were normal. There was moderate tenderness and slight muscle spasm elicited in the right lower quadrant of the abdomen. There was no rebound tenderness. A moderately soft, ropey, freely movable, tender mass about 3 centimeters in width and 7 centimeters in length was vaguely palpable in the right lower quadrant. There was no abdominal distention. Ausculatory examination of the abdomen and rectal examination were negative.

On admission the urinalysis was normal, the hemoglobin, 94 per cent; the erythrocyte count, 4,700,000; the leukocyte count, 5,900, with a normal differential leukocyte count. The Wassermann reaction and Kahn test were normal. The patient was observed for a period of four days during which time the temperature, pulse and leukocyte counts remained normal. The symptoms that were present on admission remained essentially the same. A provisional diagnosis of appendicitis was made and appendectomy advised.

On November 10, 1936, the author opened the abdomen under spinal anesthesia. The appendix was found to be free in the right iliac fossa with minimum swelling and injection of the serosa. There were no enteroliths, adhesive bands, or kinks of the appendix. The terminal ileum was the primary site of the pathology. From the ileocecal valve extending proximally for a distance of 25 centimeters, the ileum was swollen to a diameter of 6 centimeters, markedly edematous, and boggy. The greatly thickened, resistant wall of the ileum prevented palpation of the lumen. The serosa was rough, with a fine flakey, shaggy, white exudate scattered over a reddened and injected surface. Proximally, the inflammatory process was sharply demarcated from the normal ileum. Above the lesion the wall of the ileum was thin and collapsed. There was slight edema, thickening, and adenopathy of the mesentery in the region of the involved ileum. Further examination of the small intestine did not expose other areas of involvement. The appendix was removed and the stump inverted, using a purse-string suture of silk. This procedure was done even though the appendix seemed to play an innocent rôle in the inflammatory process of the ileum. The wound was closed without further surgical interference.

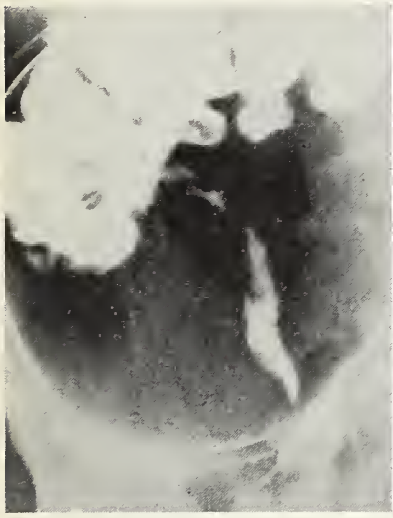

Fig. 1. Roentgenogram showing acute regional enteritis of the terminal segment of the ileum twelve days after the operative diagnosis was made.

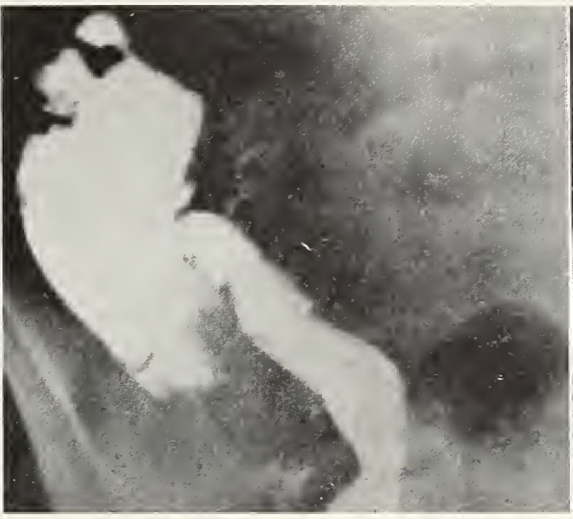

Fig. 2. Roentgenogram showing the contour of the terminal ileum two and one-half years after the onset of the acute ileitis.

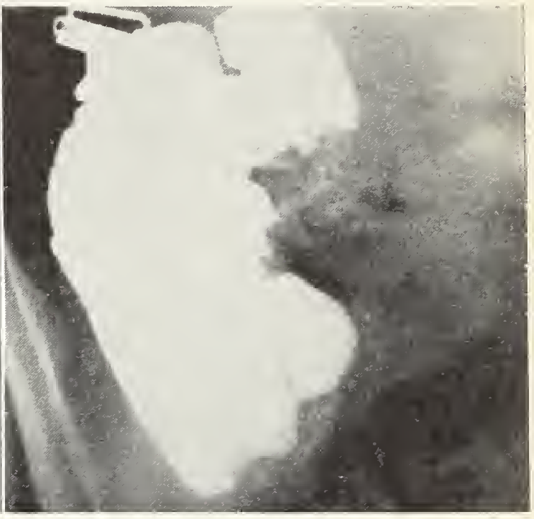

Fig. 3. Roentgenogram taken at the same time as Figure 2, with the terminal ileum partly empty showing the mucosal pattern.

There was a slight elevation of temperature following the operation with a return to normal on the fourth postoperative day. The wound healed solidly without wound complications. The patient continued to have intermittent, mild abdominal pain in the right lower quadrant, and two to three loose stools daily. His weight was 136 pounds.

The pathologist reported the appendix to be 7 centimeters long with a bulbous tip, and moderate hyperemia of the walls, but no gross induration. The lumen was patent. Microscopically, the serosa appeared slightly edematous and contained a few perivascular foci of lymphocytes. There were a few scattered polymorphonuclear cells throughout all of the coats. The diagnosis was mild acute appendicitis.

On the tenth and twelfth postoperative days roentgenographic studies of the ileum were made by giving a barium meal as well as a barium enema. The roentgenogram (Fig. 1) obtained by giving the barium orally revealed an irregular, fuzzy, filling defect of the terminal segment of the ileum with definite narrowing of the lumen suggesting the characteristic string sign so commonly observed in roentgenograms of ileitis.

On the fourteenth postoperative day the patient was discharged from the hospital to the care of his private physician, Dr. Einer Monson, to whom the author is indebted for his coöperation in completing the data in this report.

A medical regimen of rest, bland diet, and kaomagma was instituted. The patient adhered to this treatment for a period of six to nine months during which time the intermittent attacks of abdominal pain and diarrhea gradually subsided. For the past year and one-half he has been living on a normal diet with normal activity, and has been symptom free except for an occasional temporary intestinal upset following an alcoholic debauch. For a number of months he has maintained a weight of 158 pounds.

In March, 1939, roentgenographic studies of the terminal ileum were repeated by giving the barium orally. The roentgenogram (Fig. 2) showed that the terminal segment of the ileum filled normally with barium and that peristalsis was present. The fuzziness, filling defect, and string sign observed in the immediate postoperative studies were no longer present. The roentgenogram (Fig. 3) of the terminal ileum partly emptied of barium revealed the normal mucosal pattern one observes when the mucosa is faintly coated with barium. At this time fluoroscopic examination of the chest was negative. The Mantoux test was negative. The hemoglobin was 88 per cent, and the erythrocyte and leukocyte counts were normal.

Comment

In this case of ileitis, the appendix was involved with a mild inflammatory reaction diagnosed appendicitis by the pathologist. A slight involvement of this nature is unusual but it could be secondary to or associated with the primary disease process in the terminal segment of the ileum. The appendix cannot be justly accused of being the causative agent of the disease process in the ileum nor can the spontaneous recovery be attributed to the removal of the appendix. Crohn[2] states that in at least 33 per cent of his cases the appendix had been removed at a previous operation without affecting or inhibiting the course of the ileitis. In retrospect, it is probably best not to remove the appendix since the danger of establishing an external fistula is great in a disease characteristized by a tendency to fistula formation.

Crohn[2] and Mixter[4] recommend conservative management as the treatment of choice in the acute stage of regional enteritis. With the patient on a strict medical regimen, it is possible that a complete regression of the disease may take place spontaneously.

After a few months of careful medical management, if the disease progresses to the early ulcerative stage where only slight fibrotic changes have occurred, there is still an even chance that a complete regression may take place if the more conservative surgical procedure, a short-circuiting operation, is performed. Crohn[2] says that in a series of twenty cases in which a short-circuiting operation had been performed, usually an ileocolostomy with transection and exclusion of the diseased ileum, ten patients were well after a follow-up of two to three years. The ten other patients did badly and had to submit to resection. He claims that there is a higher operative mortality rate in subsequent resections than in primary resections.

In the chronic, advanced stages of the disease, with marked fibrotic and stenotic changes, fistulas, and extensive mesenteric adenopathy, all observers agree that a radical resection in one or two stages is indicated. Resection and primary anastomosis or anastomosis according to the modified Mikulicz procedure may be performed. A wide excision of the diseased bowel and its mesentery offers the greatest chance for a permanent cure.

Summary

A case of acute regional enteritis involving the terminal ileum with spontaneous regression of the disease is reported. The diagnosis was made by observing the gross pathology at the time of operation, and further confirmed by characteristic roentgenographic findings. After nine months of medical treatment, the patient recovered completely and has remained well more than two and one-half years after the onset of the disease. Late roentgenologic studies disclosed a normally functioning ileum. A conservative medical regimen is advised in the treatment of the acute stage of regional enteritis.

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EASILY OVERLOOKED CONDITIONS OF THE BACK AND SHOULDER GIRDLE: THEIR RELATION TO PHYSICAL THERAPY*

FRANK H. KRUSEN, M.D., and WILLIAM C. BASOM, M.D.
Rochester, Minnesota

PATIENTS who have lesions of the spinal column and surrounding structures frequently are referred to hospital departments of physical therapy. For this reason it seemed wise to point out six of the most important of these lesions and to describe the condition, the affections for which it is commonly mistaken, the usual signs and symptoms and the relation of physical therapy to its management. This material was prepared first in the form of an exhibit, but interest in it was sufficient to encourage us to submit the same material in the form of an article.

The six conditions which we will discuss are: (1) coccygodynia due to muscle spasm, (2) fibrositis of the back, shoulder or neck, (3) hypertrophic arthritis of the cervical portion of the spinal column with secondary radiculitis, (4) protruded intervertebral disk, (5) scalenus anticus syndrome and (6) spondylolisthesis. These conditions are often mistaken for similar, more common lesions, and we feel that one should learn to recognize them and know their management.

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*From the Section on Physical Therapy (Krusen), The Mayo Clinic, Rochester, Minnesota, and Fellow in Orthopedic Surgery (Basom), The Mayo Foundation, Rochester, Minnesota.

Coccygodynia

In the presence of coccygodynia the coccygeal region is painful; this is often caused by spasm of the levator ani, coccygeus and piriformis muscles. Coccygodynia of this type is commonly mistaken for coccygeal injury, sciatic neuritis, intrapelvic lesions and lumbago.

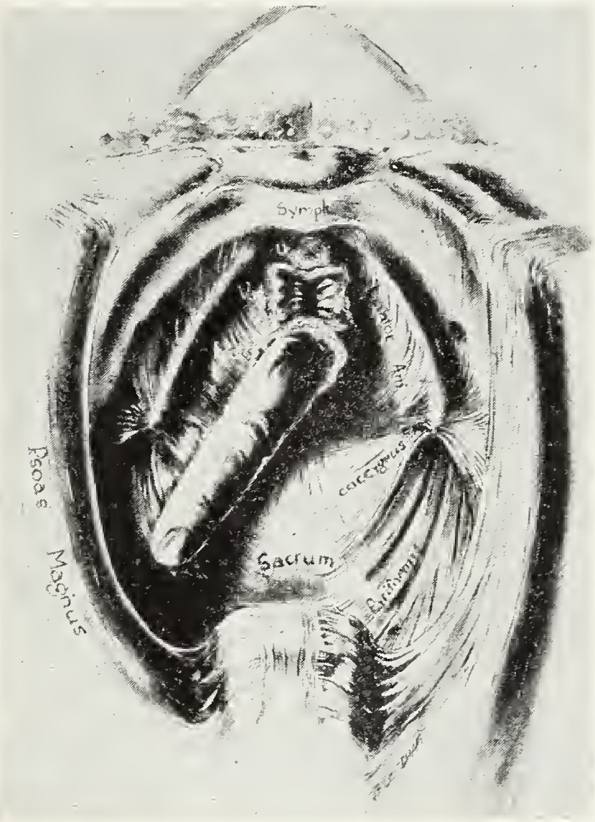

Fig. 1. Method of internal massage for relief of spasm of levator ani, coccygeus and piriformis muscles. (After Thiele.[1])

The coccygeal region may be tender; and tonic spasm and tenderness of the levator ani, coccygeus and piriformis muscles may be present. An acute injury such as fracture or dislocation of the coccyx is not found. There may be sciatic and supragluteal tenderness at times and patients tend to walk stiffly and to sit on one buttock. The symptoms are pain in the coccyx and/or supragluteal region which may or may not extend down the back of the thigh. These symptoms are worse when the patient is sitting and are relieved if he lies on his side.

Relation of physical therapy to management.—There is a vicious cycle, pain, muscle spasm; more pain, more spasm. One should use radiant heat or diathermy and massage to the lower part of the back, coccygeal region and gluteus muscles. This should be followed by a special type of internal massage performed according to Thiele's technic[1] (Fig. 1) as follows: Insert the full length of a finger into the rectum with its flexor surface across the levator ani and coccygeus muscle, and its tip on the piriformis muscle. Massage in the direction of the long fibers as a strop is stroked by a razor. Massage lightly at first and increase the pressure at subsequent treatments. If improvement does not take place after four to six daily treatments, seek orthopedic or other consultation. Thiele[1] has reported that 60 per cent of his patients were cured, and 33.7 per cent definitely improved.

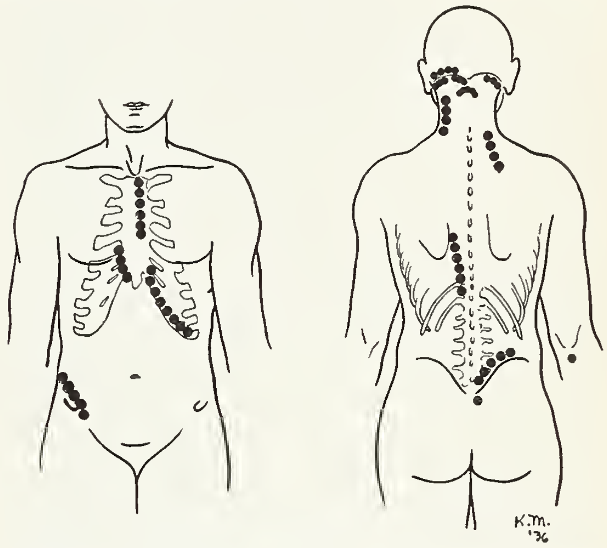

Fig. 2. Common situations of nodules in cases of fibrositis in the back. (Courtesy of Dr. C. H. Slocumb.[3])

Fibrositis of Back, Shoulders or Neck

The lesion is a primary infectious chronic inflammation involving the white fibrous tissue of the fasciæ, aponeuroses, sheaths of muscles and nerves, ligaments, tendons, periosteum and subcutaneous tissue[2,3] (Fig. 2). In the neck or shoulders the lesion is often mistaken for brachial neuritis, cervical arthritis, migraine or occipital headache. In the lumbar region it may be confused with sacro-iliac disease, sciatic neuritis, atrophic arthritis or myositis. In both regions it is frequently diagnosed as chronic nervous exhaustion.

The usual signs of fibrositis are palpable indurations, fibrous thickenings and nodules in the muscles or fasciæ, associated with tenderness, swelling and muscular hypertonicity. The symptoms are muscular and periarticular pain and stiffness, particularly morning stiffness and "jelling" (stiffness after a period of inactivity), fatigue, aching and chronic lack of energy.

Relation of physical therapy to management.—Radiant heat and firm massage applied directly to the indurations and stretching exercises are indicated. More than 80 per cent of patients who continue such treatment for many weeks report lessening of the severity and frequency of flare-ups of pain and stiffness. Ordinary massage is of little or no value. Other methods of treatment must be used in conjunction with continued physical treatment to combat the frequent recurrences.

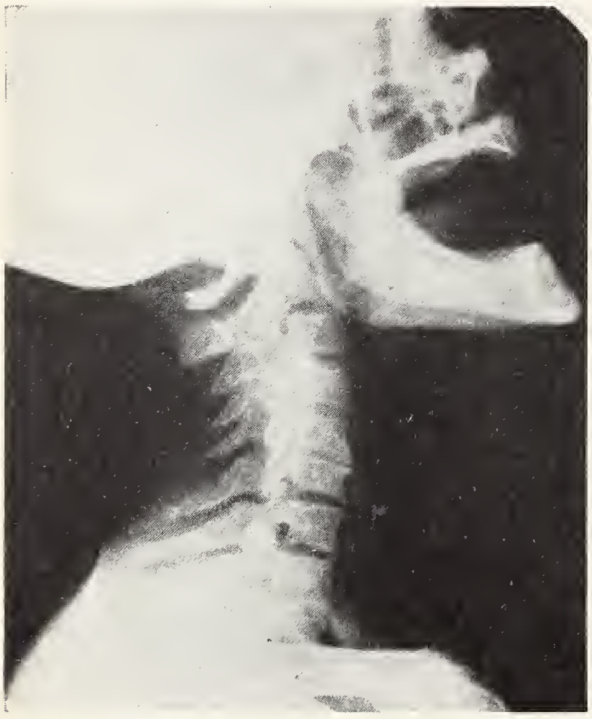

Fig. 3. Cervical portion of the spinal column; hypertrophic lipping of cervical vertebræ with narrowing of an intervertebral space in a case of severe secondary radiculitis.

Hypertrophic Arthritis of Cervical Part of the Spinal Column

The lesion is a hypertrophic marginal lipping of the cervical vertebræ with narrowing of one or more intervertebral spaces[4,5,6] (Fig. 3). Frequently, a secondary radiculitis is present. The condition is often misdiagnosed as brachial neuritis, angina pectoris, cervical rib, fibrositis or arthritis of the shoulder.

The signs of hypertrophic arthritis of the cervical part of the spinal column are tenderness and limited motion of the neck, tenderness along the affected nerve and atrophy of the affected muscles. The symptoms are primary pain and stiffness of the neck which is often relieved by traction or forward flexion and secondary segmental neuritis such as pain in the shoulder, arm, pectoral, or precordial region. Symptoms directly referable to the cervical part of the spinal column may be lacking. There is often weakness or tingling of the hands.

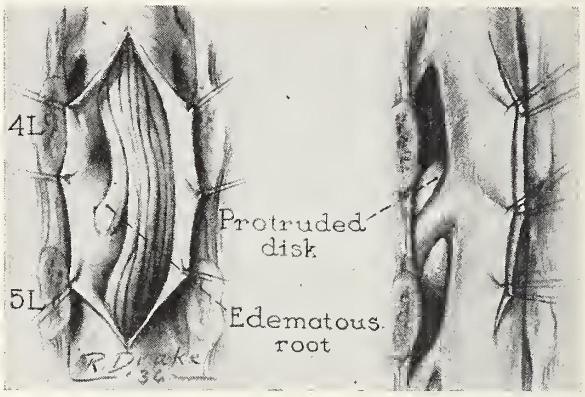

Fig. 4. Appearance at time of operation of a protruded intervertebral disk. (After Love and Camp.[7])

Relation of physical therapy to management.—Treatment is largely by physical means. Radiant heat, diathermy or roentgen therapy, followed by massage and cervical traction, is often beneficial. If secondary segmental neuritis is present, one should always consider the use of cervical traction. It may give dramatic relief. A Sayre's head sling or homemade head sling may be used for traction. A Thomas collar may help to maintain traction. Soft rubber soles and heels will often relieve the patient of discomfort by preventing jarring. Massage of the muscles of the neck and lightly forced rotation of the neck performed according to Hanflig's technic[5] may be applied during traction. Manual traction and rotation of the neck are sometimes helpful.

Protruded Intervertebral Disk

The lesion is a protrusion of one or more intervertebral disks into the spinal canal[7,8] (Fig. 4). In such cases a diagnosis of intraspinal neoplasm, sciatic neuritis, lumbosacral strain, sacroiliac disease, spondylitis, fibrositis or lumbago is encountered frequently. When a protruded intervertebral disk is present, the Lasègue sign may be positive, the Achilles-tendon reflexes diminished, the sciatic or other nerve roots tender, total protein content of the cerebrospinal fluid increased or the protruded disk visualized in the roentgenogram following injection of iodized oil into the intraspinal subarachnoid space. All the known signs may be found in other conditions.

The chief symptom is intermittent root pain, which is often unilateral, sharp and shooting, is usually in the sciatic nerve, and is often described as being "like an electric shock." The pain is aggravated by coughing, jarring or sneezing. It may be precipitated by tension on the involved nerve. Occasionally there is numbness and weakness.

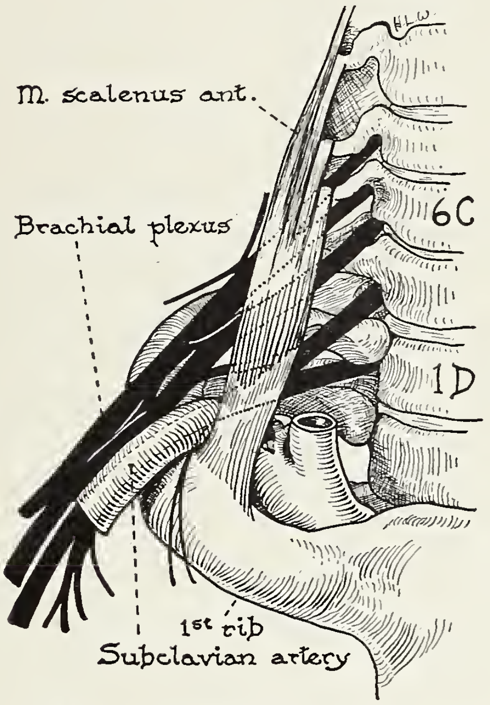

Fig. 5. Compression of the brachial plexus and subclavian artery by a hypertrophied scalenus anticus muscle. (After Spurling and Bradford.[9])

Relation of physical therapy to management.—In the presence of intractable sciatic neuritis one should suspect a protruded disk. Neurologic and roentgenologic studies may reveal its presence or absence. If a protruded disk is present, physical measures should be discontinued and the disk should be removed surgically. Flexion of the spinal column may cause a protruded disk to be drawn back into the intervertebral space, while hyperextension of the spinal column may cause increased protrusion of the disk. This fact may explain the occasionally reported sudden relief or severe aggravation of sciatic pains during the unskilled manipulation of cultists. There is probably more danger of aggravation since most manipulations by cultists are said to be performed with the spinal column in hyperextension. Any manipulation is dangerous and can produce no permanent relief.

Scalenus Anticus Syndrome

This syndrome is produced by compression of the brachial plexus and the subclavian artery by a contracted, hypertrophied or anomalous scalenus anticus muscle. Compression usually occurs on one side only[9] (Fig. 5). The condition may be mistaken for brachial neuritis, cervical rib, segmental neuritis secondary to hypertrophic cervical arthritis or for fibrositis.

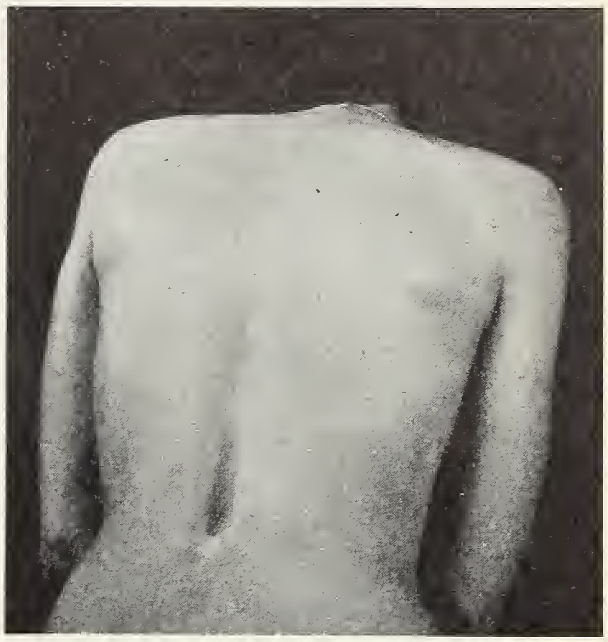

Fig. 6. The appearance of the back in spondylolisthesis showing the grooved lumbar portion of the spinal column and prominence of the erector spinæ muscles. (Courtesy of Dr. H. W. Meyerding.[10])

Signs present in scalenus anticus syndrome may be tenderness of the scalenus anticus muscle, pain on pressure above the clavicle, diminution of the radial pulse on deep inhalation and on turning the head toward the involved side and obliteration of the radial pulse on pressure over the scalenus anticus muscle. The symptoms are pain, muscle weakness and paresthesia which occur chiefly in the region of the ulnar nerve, but also may occur in the distribution of the median and radial nerves.

Relation of physical therapy to management.—One should suspect this lesion in cases of intractable pain of the brachial nerve. Application of a figure-of-eight bandage to the shoulders, elevation of the elbow in a sling or having the patient lie with arms above his head may cause relief of pain. Operative section of the muscle may be necessary to relieve the symptoms.

Spondylolisthesis

The condition consists of a forward and downward lumbosacral or lumbar vertebral subluxation. It usually follows trauma.[10] It may be misdiagnosed as postural backache, sacro-iliac disease, sciatic neuritis, lumbosacral arthritis, railway spine or lumbago.

The deformity is illustrated in Figure 6. The patient often has a grooved lumbar part of the spinal column, shortened torso, abdominal crease and lordosis associated with spasm and prominence of the erector spinæ muscles. The symptoms are pain, stiffness and weakness in the lower part of the back, sacro-iliac region, hips and legs. The symptoms are relieved by recumbency. There are no symptoms in 10 per cent of cases.

Relation of physical therapy to management.—In 10 per cent of the cases no symptoms occur and observation only is required. In 17 per cent spinal fusion is needed. In the other 73 per cent combined orthopedic and physical therapeutic management is required. One should attempt to reduce the deformity by traction and to prevent recurrence by the application of a cast. A "rocking chair belt" may be used for support. Radiant heat and sedative massage, applied to the back, tend to relieve pain and muscle spasm. Although this is probably a congenital defect, when mild it should be treated as a postural backache. The utilization of exercises to decrease pelvic obliquity should be considered.

Conclusions

Knowledge of the six conditions under consideration, which are apparently much more common than is generally realized, should tend to establish the diagnosis in a larger percentage of cases and to aid in the physical therapeutic management.

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PREGNANCY AND CHILDBIRTH AMONG THE NORTH AMERICAN INDIANS*

JOHN L. ROTHROCK, M.D.

Saint Paul, Minnesota

AUTHENTIC information regarding the manners and customs of the Indian tribes that inhabited the North American continent on the arrival of the European whites is considerable and varied, and from the aggregate it is possible to reconstruct a fairly accurate picture of the daily routine of the lives of the Indians as they were influenced by location and environment.

While all tribes had many customs and beliefs in common, the language of each major division was distinct (though frequently dialects existed) and manners and customs in general conformed to the pattern of the parent group.

Concerning the customs pertaining to the management of childbirth, reliable information is meager from the fact that competent observers were rarely privileged to witness the act of labor, since the Indian woman was herself by custom and tradition secretive about the act, and members of the tribe were no less so about giving out information pertaining to a natural process which they considered most private. Even the Jesuits, who in their zeal to make converts, often at the risk of their lives, lived in close contact with Indians for long periods, have left us little or no record of customs and practices pertaining to childbirth.

Although the Indians of the east were the earliest to be contacted by the whites, their life was nomadic, and doctors who might have been sources of information were relatively sparse even in relation to the white population. It is not surprising therefore that no records pertaining to this subject are available.

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*Address of retiring president of Minnesota Society of Obstetrics and Gynecology, Minneapolis, April 29, 1939.

The scant information available is derived chiefly from letters, diaries and reports of army officers and Post surgeons whose contact with nearby Indian tribes of the west furnished the source of information on this subject.

It is reasonable to conclude that while differences in methods and practice were common among the various tribes, in the main their plan of procedure followed a rather uniform pattern and it is interesting to note that in comparison with customs and practices of primitive tribes the world over, there was a surprising similarity.

In the consideration of this subject I shall confine my attention to those groups of nomadic tribes of Indians that inhabited the middle and north central west, and will not include the customs of those tribes that lived in the larger permanent communities of southern latitudes, which depended in a large measure on the products of agriculture for their living.

The plains Indians and all those who depended largely on game animals and fish for their food of necessity lived in small groups in isolated villages, the entire group numbering at most a few hundred inhabitants. Only on special occasions, as for hunting or tribal council, were they accustomed to assemble in larger groups. In winter they lived in permanent camps, the site being chosen for its advantages, usually a secluded spot on the banks of a stream along which were to be found abundant supplies of wood and where water was readily accessible.

In summer the band changed camp location frequently, choosing a site in a location favorable for the contemplated activities of the band, whether for hunting or fishing, the gathering of fruit or for the growing of vegetable crops, which among plains Indians was not an important activity.

In order to get an intelligent approach to this subject it is desirable to reconstruct the pattern of the routine daily life of the Indian woman, from childhood to the age of puberty, soon after which she married and bore children.

From earliest childhood the relation of the mother to the child was most intimate and she alone cared for the baby until it could walk, never permitting it to be out of her sight.

Children were taught early the lesson of subordination by the mother.

If the baby rebelled and cried the mother made use of a very simple and effective method of discipline by simply clapping one hand over the baby's mouth and with the other hand grasping its nose. The astonished baby, gasping for breath, would cease its crying, and if on relaxing her hold it attempted to cry again, the process was repeated. Under this discipline the baby soon learned that silence was golden and that it could expect no sympathy from the mother.

The girl soon after she could walk began to help her mother in light tasks about the lodge. As she grew older she was required to assist in cooking, in making and mending clothing, gathering wood and bringing water and was soon graduated into that round of wearisome labor which was to be her lot.

As a girl her work was mainly in and about the family lodge, where she was under the watchful eyes of her parents.

She was never sent out alone to cut or bring wood or water from a distance, as for an unmarried girl to be found away from her lodge alone was to invite outrage. She might go on these errands in the company of her mother, but as a rule all heavy work was done by older married women. She was taught early to do the ornamental bead and quill work and the finest specimens of this art on moccasins and clothing were samples of her handicraft.

The Indian girls even in northern latitudes were precocious and matured early. Of the plains Indians, according to Colonel Richard I. Dodge, girls began to attend dances and social gatherings at the age of eight or ten and at this age many were comely and attractive and were quite aware of their charms. The girls reached the age of puberty at about the age of ten and in the bloom of youth her attractiveness soon brought her a suitor and she married.

It is this phase of her life that engages our attention at this time.

After her marriage the lot of the Indian woman was one continuous round of drudgery. Her daily routine was somewhat as follows. In March, as soon as the snow was gone, in addition to cooking and mending clothes and caring for the children, she gathered firewood. If beans, maize or vegetables were raised it was she who prepared the soil, planted, cultivated and harvested the crops.

On breaking camp it was the women who did all the work taking down the tepees, gathering up and transporting all their belongings and setting up camp in a new location.

It was the women who skinned and butchered the game animals that were brought into camp, and in the days when buffalo roamed the plains the women followed the hunting parties, skinned and cut up the carcasses where the animal had fallen and often carried the meat into camp. It fell to her lot to cure and smoke the surplus of meat or fish that was brought into camp and to store it away for future needs. It was she who laboriously prepared and tanned the hides, which afterwards she fashioned into clothing and shelters.

As a result of this hard life and constant work, the Indian woman before she had passed her teens had lost her early freshness and it was impossible from appearance even to approximate the age of an Indian woman. One of eighteen years might look as old as her mother of thirty-five.

The average age attained by the Indian woman of the plains tribes was thirty-five to forty years. That attained by the men, owing to their constant warfare and accidents of the chase, was even less. Of course a few individuals attained a greater age.

At this early date, however, the average life expectancy among civilized peoples was scarcely more, but in comparing them with the Indians we must take into consideration the fact that this low average duration of life among whites was due in a large measure to the very high mortality which prevailed in infancy and childhood from acute infectious diseases, from which the Indians in their primitive state, until contacted by whites, were exempt.

The Indian mother nursed her baby for at least two years and only in case of failure of the mother's milk was the life of the baby endangered, and even here the deficiency was often supplied by other nursing women of the band.

According to Colonel Dodge, the Indian woman, whether from lack of suitable food or from constant drudgery, though perfectly healthy, was not prolific. Other observers confirm this statement. The family of even four children was rare and a few were childless. The average in most tribes was scarcely more than two children per mother.

Children were highly prized and earnestly desired, especially by the father, for whom the girls constituted a source of revenue when they reached the marriageable age.

Abortion was rare among the primitive plains Indians. Polygamy was generally practiced and three or four wives were common, all living together in harmony in one lodge. The wife who had the most children was the most honored, but not always the most favored.

The custom of pleural marriages was no doubt in a measure responsible for the small number of children per mother, though Catlin thought it was due to the long period of lactation practiced, thus lengthening the interval between pregnancies. Just what influence the arduous life of the Indian woman, with often insufficient food, had to do with fertility is not known. Their food, according to the locality in which they lived, was meat, fish and vegetables, often eaten raw, and nuts, seeds and fruits. Few areas furnished all these supplies, but as the Indians ate every part of an animal and the flesh of almost every animal, as well as every edible plant in their locality, they came nearer to a balanced ration than might be supposed. It is, however, fair to assume that they did at times suffer from malnutrition from insufficient food or errors in diet.

It seems more likely that the limited number of children per mother was the result of the practice of polygamy, the younger and more attractive women supplanting the older and commanding the attention of the husband, although other mentioned factors no doubt played a part.

Sterility among the plains women, according to accounts, was not common, and venereal disease was unknown before contact with the white race.

Among the plains Indians the pregnant woman received but little consideration and continued to work until the onset of labor.

It is of interest to note that the Indian woman enjoyed an immunity from most of the complications and dangers that beset women of civilized peoples during pregnancy. Spontaneous abortion, ectopic pregnancy, placenta previa, and premature separation of the placenta were practically unknown.

Their freedom from venereal disease and their strenuous outdoor life contributed to the development of healthy and well developed bodies.

Multiple pregnancies, while occasionally mentioned as occurring among Indian tribes, appear to have been far less common than among whites. Catlin states that on diligent inquiry among the many tribes he visited about the year 1835, he failed to hear of a single instance of twins. Other writers, however, mention their occurrence and among some tribes it was considered an omen of good luck, while with others it was bad medicine.

Toxemia and eclampsia appear to have been unknown among the Indians in their primitive state and it is probable that their mode of life and restricted diet were important factors contributing to their immunity.

While salt was commonly used by Indians when it was easily obtainable, it does not appear to have been an indispensable article of diet. Colonel Dodge, an authority on the habits and customs of Indians, states that even in their wildest state all the Indians he had ever known used salt with their food when they could get it. Sodium chloride is so widely distributed throughout the land that it could be easily obtained in almost every locality.

On the other hand, Frances Densmore, an authority on Chippewa customs, writing of the primitive Chippewa Indians, states that salt was unknown in the early days.

Also Parkman, who drew his information from the Jesuits who lived among the Hurons, states that maize was the staple article of their diet, which they cooked and ate in various forms without salt. He also relates an incident relative to the Iroquois tribes who, on their first contact with Jesuit priests who had come among them, marveled at the strange custom of putting salt on their food, and, being noted for their sense of humor, debated among themselves the question as to whether the flesh of a white man who ate salt on his food would taste salty.

At all events from information at hand, salt was used sparingly, if at all, by the primitive Indians and its use was governed to some extent by easy accessibility.

The sodium chloride necessary to maintain the balance in the system was present in the food they ate. It is said to have been a common practice among warriors to drink the blood of a freshly killed animal. Since animal blood is rich in sodium chloride, may it not have been their hunger for salt that gave rise to this practice?

From the foregoing we may fairly assume that the Indian woman lived on what was the equivalent of a salt-free diet and if the opinion of De Snoo is correct, that on a salt-free diet a woman never develops toxemia or eclampsia, might this custom explain their immunity from toxemia?

The act of labor among primitive plains Indians assumed no such importance as among civilized peoples. Generally speaking it was short, uneventful and was accomplished in privacy, often in the absence of an assistant.

The average duration of labor among primitive tribes was from one to two hours with perhaps an additional hour for women giving birth to their first baby. From accounts at hand the difficulties and complications so frequent among civilized peoples were rare. Thus we read accounts of Indian women overtaken with labor pains while on march from one camp to another in which the woman simply stopped by the side of the trail and in the seclusion of a clump of bushes gave birth to her baby, made its toilet, and caught up with the caravan, so short and uneventful was the labor. But from such accounts it must not be concluded that births were always so easy and uneventful. Among civilized peoples short and easy labors are by no means infrequent and who among us has not had the experience of arriving at the home or hospital only to learn that the birth had taken place before his arrival?

The freedom from complications of the Indian woman was probably due to several factors which contributed to a short and easy labor.

The Indian woman from early childhood was favored by her open-air environment and was habituated to arduous duties and arrived at maturity with a healthy and well developed body. As before mentioned, as a baby she was nursed at her mother's breast for the first two years of her life at least among the plains Indians. Rachitis was unknown as was also pronounced deformity of the pelvis from other causes. Her strenuous life, and frugal diet which at times amounted to restriction bordering on starvation, regulated and restricted the growth of the fetus to limits which insured an easy passage through the bony pelvis. Post-maturity with overgrown babies was unknown.

According to Hrdlicka, measurements of a large group of skulls of Indian tribes showed that while the cranial capacity of the tribes differed, the average capacity was about the same as of the white races, namely about 1,360 g. for males and about 200 g. less for women.

As compared with the white race, Hrdlicka notes a difference in shape of the cranium of most tribes conforming to the meso-cephalic type with low vault, large face and jaws, and median high orbits.

Outstanding in cranial capacity according to Parkman were the Hurons and Iroquois, both of the same racial stock, but the increased capacity was chiefly in the occipital region and base of the skull, while in other respects the shape of the cranium conformed to the predominant type of the various tribes described by Hrdlicka.

In contrast to certain white types the biparietal diameter was comparatively less.

Malpositions, faulty presentations and positions constituted the most serious hindrance to delivery among Indian women. But the average percentage of deviation is so small as to constitute a rather infrequent complication.

When it is recalled that vertex presentations occur in 95 per cent of all cases, it is safe to conclude that of the remainder, few indeed caused trouble.

Granting, for reasons previously stated, that the Indian child was small at birth and that the shape of the head was favorable and the cranial bones soft and yielding, most of the vertex malpositions likely to cause trouble other than the rare brow or face presentation could be left out of consideration.

As for breech presentations, while they constituted a possible danger for the baby, they had less significance for the mother.

Transverse presentation, occurring about once in 200 cases, was a real menace to the life of both mother and child. This much dreaded complication was one which seldom yielded to the expulsive forces of labor and for which neither the help of assistants nor the magic of the medicine man availed when the shoulder was impacted or an arm was prolapsed.

Sometimes manipulation, or the application of massage over the abdomen at the beginning of labor, which was a common practice, corrected the position, causing one or other pole of the fetus to descend into the pelvis. If this failed, the woman usually died undelivered.

Fetal deformities appear to have been less common than in the white race and, according to Hrdlicka, hydrocephalus was unknown.

Although most Indians made use of herbs and the bark and roots of certain shrubs and trees in various disorders for their healing properties they were rarely used during labor. The Skohomish sometimes gave a tea of uvi ursa leaves just before the child was born. The Uinta woman was encouraged to drink copiously of hot water. The Crow Indians of Montana are said to have used a decoction of various roots and leaves. The Winnebagos and Chippewas gave a decoction of roots believed to relax the system and to promote the birth of the child.

In difficult or delayed labors massage and pressure with the hands over the abdomen was practiced by most Indian tribes during labor and by some even before labor during the latter part of pregnancy.

This practice had a rational basis and no doubt sometimes corrected malpositions if done before or early in labor. Pressure over the abdomen was the application of the principle of Kristeller's maneuver, and massage over the abdomen served to stimulate the uterus and to increase the frequency and force of the pains, all of which were rational procedures. Attempts at internal manipulation were never made, for they suggested no means of assisting delivery to the Indian who was ignorant of the cause of the delay.

With most tribes the act of delivery took place in the privacy of seclusion. In summer, the Indian woman, on recognizing the approach of labor, would steal off into the woods or to some secluded spot in a thicket or by the side of a stream or lake, if such convenience was at hand, either alone or with an attendant, usually a female relative or friend.

Among northern tribes in winter and with a few others, by custom, a temporary shelter was erected in the vicinity of the lodge, usually a wicke-up or shelter made of brush. The ground within was strewn with small branches, grass or leaves or in the absence of these a piece of cloth or blanket was spread on the ground.

Immediately after labor the mother bathed herself and baby, if water was at hand, and with her newborn returned to the family lodge and resumed her usual occupation. This seems to have been the universal custom of most tribes of north central and plains Indians.

Any assistance rendered was of the simplest character and consisted entirely of external manipulations and support of the patient in whatever position she might assume. Expression was made by an assistant standing behind the patient, her arms encircling the abdomen with the hands clasped in front of and over the fundus of the uterus. As a substitute for this sometimes a bandage was applied over the abdomen just above the fundus of the uterus, the ends of which were brought together behind the patient and held by the assistant.

In some tribes it was the custom for the woman to bend over a pole or rope in such a way as to make pressure over the uterus. Others applied a belt about the abdomen just above the fundus of the uterus, which was tightened from time to time with the view of forcing the uterus down. This was called the squaw belt. Another method in the attempt at promoting delivery in difficult cases was leaning on a staff firmly planted in the ground, making pressure over the uterus. This procedure was also frequently used to hasten the expulsion of the placenta.

In some tribes the woman assumed the prone position with a pillow under the abdomen making pressure over the uterus. Others suspended the patient by a rope passed underneath the arms and thrown over the limb of a tree. In this position the assistant with arms encircling the abdomen made pressure over the fundus of the uterus.

If these methods failed in difficult labors, they were supplemented by the incantations of the medicine man and other means of acting on the imagination of the patient.

Post surgeons were called only in the most desperate cases where all other efforts at assistance had failed.

Various positions were assumed by the woman in labor usually following the whim or natural inclination of the patient.

Probably the most common was kneeling and clinging to a tent pole, the body inclined forward or to a rope or horizontal staff with body inclined backward.

Among many, the squatting posture was a favorite position, notably with the Pawnees, Nez Perce, and Gros Ventres. Others assumed the semi-recumbent posture in the lap of an assistant on the floor.

A favorite position with the Brule Sioux and Canadian Iroquois was standing erect, clinging to the neck of an assistant.

Among others the patient was tied to a tree or suspended from the limb of a tree, while others adopted the knee-chest posture.

Other aids occasionally employed were steam baths, occasionally emetics. Nauseating decoctions were employed but their use seems to have been sparing.

With most tribes of plains Indians the third stage of labor was short, the placenta being delivered soon after the birth of the child.

The procedure in most common use was to make pressure over the uterus with the patient in the same position in which she was delivered. In case the third stage was unduly prolonged, massage and kneading of the uterus was practiced.

Some tribes made a routine practice of the squaw belt and frequently gentle traction was made on the cord. In case of delay the patient was raised to the erect posture and manipulation from above and traction on the cord were continued. Traction on the cord was always done with caution, experience having no doubt taught them the danger of tearing off the cord, thus further complicating delivery of the placenta.

It is significant to note that efforts at delivery of the placenta were limited to external manipulations, massage or pressure over the uterus, the Kootenais alone being reported to have practiced internal manual delivery of retained placenta if other methods failed.

Usually the cord was not severed until after the expulsion of the placenta though a few are reported to have cut the cord as soon as the child was born and the end of the cord was then grasped and held lest it should retract into the vagina. The cord was usually severed about a foot from the umbilicus and a common practice was to saw it through with the sharp edge of a shell. The cord was never ligated.

Hemorrhage accompanying or following the third stage appears to have been rare. The treatment commonly applied was to souse the patient in the cold water of the nearest stream, or, lacking that, cold water was forcibly dashed over the abdomen, the process being repeated until the hemorrhage ceased.

Immediately after the delivery of the placenta the Apaches raised the patient to her feet and compelled her to walk about for half an hour or so to favor the free discharge of retained blood. This practice was also common among the Dakotahs and most tribes of the northwest.

Often the squaw belt was worn for some days after delivery.

Most of the plains Indians observed no period of rest following delivery, and the woman resumed work as usual the same day or day after the birth.

Puerperal infection appears to have been rare among plains Indians according to reports and this can be attributed in part to the custom of isolation from the family lodge to a fresh clean shelter during the act. A far more important factor was the avoidance of internal manipulation during labor to promote delivery, in the absence of contact with the external genitals by hands or agencies which might carry infection.

Now, let us consider briefly the effects of contacts with white civilization on pregnancy and labor among Indians. There is much evidence to show that the difficulties of childbirth increased in proportion to the intimacy of their association with the white race. Intermarrying with whites resulted in larger babies with contours of heads that did not conform to the shape of the Indian pelvis and this led to a marked increase of malpositions. Other conditions such as the less strenuous life and the partial relief from hardship of Indian women whose contact with civilization insured a more liberal and constant supply of food as compared with the often scant supply of the Indian living in the primitive state must also be taken into consideration.

Complications unknown to Indians living in their primitive state soon afflicted Indian women so that there is now comparatively little difference in their susceptibility to diseases common among the white race.

In order to check on the subject of pregnancy and childbirth of primitive Indians as compared with present-day Indians living on the reservations, I recently sent a questionnaire to government doctors on the reservations and these are some of the replies I received.

1. *Admixture of white blood* among Indians on the reservations ranged from 25, to 40 or 50 per cent. It is much less among the Indian tribes of the Southwest.

2. *Venereal disease.* Both gonorrhea and syphilis are prevalent, ranging from 15 to 25 per cent. The percentage is relatively higher the closer the Indian lives to white communities.

3. *Complications of pregnancy.* About half the replies received report ectopic pregnancy and placenta previa as uncommon and the remainder about the same as whites.

4. *Complications of labor.* Two report malpositions as common, and two as rare.

5. *Toxemia.* All report it as less than among whites.

6. *How cared for at delivery?* Fifty to 100 per cent delivered in government hospitals; the remainder by midwives.

7. *Puerperal infection* is reported as not common.

8. *Congenital deformities* are reported as rare.

9. *Twin pregnancies* are reported as uncommon by two and as about the same as whites by two.

10. *Sterility* is reported as not common.

11. *Tumors of the uterus* are reported as less common than among whites. This applies to both fibroids and carcinoma.

12. *Tumors of the ovaries* are reported as a little less common than among whites.

Exhaustive studies have been made of the susceptibility of the Indians to malignant disease, and, while the results have at times been conflicting, practically all agree that among Indians living in present-day conditions cancer is less common than in whites. There is reason to believe that it was much less among primitive Indians as in most instances they died before the cancer age, the average age reached being thirty-five or forty years.

From these reports derived from Indians living on the reservations the trend points to a marked increase in their susceptibility to the white man's diseases, and this raises the question whether this is due to the admixture of white blood or to changes in environment and living conditions which today approach the living conditions of the poorer class of whites in sparsely settled rural districts. Probably both factors have contributed to bring about this change.

Certainly the subject is intriguing and is deserving of further study.

INTESTINAL OBSTRUCTION: WITH A STATISTICAL STUDY OF THE ASBURY HOSPITAL CASES*

CLAUDE C. KENNEDY, M.D., and HARLOW J. HANSON, M.D.
Minneapolis, Minnesota

"It is a surprising thing," stated Dr. C. J. Miller in 1933, "that with all our knowledge and advancement in the subject of surgery and medicine, the mortality of obstruction has not been reduced more than 50 or 60 per cent over that of a number of years ago. Our methods of diagnosis, the symptoms, and x-ray make the diagnosis of obstruction fairly accurate and quickly in nearly all cases. What, then, are the causes or cause of death in obstruction?"

Causes

In reviewing the literature on ileus, a great variety of opinions were found in regard to the cause and effect of intestinal obstruction. As to the causes the following is presented as a clinical classification:

1. Mechanical obstruction
   - A. Narrowing of the lumen
     - (1) Strictures of the bowel wall
       - (a) Congenital
         - (1) Atresia
         - (2) Imperforated anus
       - (b) Acquired
         - (1) Inflammatory
         - (2) Traumatic
         - (3) Vascular
         - (4) Neoplastic
     - (2) Obturation
     - (3) Compression from without (especially pelvis and retroperitoneal duodenum)
   - B. Intestinal obstruction due to adhesions and bands
     - (1) Congenital
     - (2) Inflammatory
     - (3) Neoplastic
     - (4) Traumatic
   - C. Hernia
     - (1) External hernia
     - (2) Internal hernia
   - D. Volvulus
   - E. Intussusception
   - F. Errors in development of gut which give rise to intestinal obstruction
2. Intestinal obstruction due to nervous unbalance (physiological obstruction)
   - A. Inhibition (paralytic ileus)
   - B. Spastic or dynamic obstruction
3. Vascular obstruction
   - A. Intestinal obstruction due to mesenteric thrombosis or embolism

Symptoms

In the years up to 1931 numerous theories had been advanced to explain the symptoms of acute intestinal obstruction. The following are the principal theories:

1. The intoxication theory. This theory presupposes that a toxin is formed within the bowel which is absorbed into the blood stream producing characteristic signs and symptoms.
   - (A) Toxins resulting from putrefaction of stagnating food within the intestinal tract. This work was done by Albeck, Lepine, Mollier, Roger, and Garner.[3] There is relatively little evidence to support the theory that "intoxication" is the result of absorption of putrefaction substances. Putrefaction is relatively rare in the upper intestinal tract where the most marked symptoms occur following intestinal obstruction.
   - (B) Toxins arising from bacterial invasion of the obstructed gut. Murphy, and Brooks and his co-workers[3] found that a normal gallbladder could be obstructed without the production of any signs of intoxication. If, however, following obstruction and interference with the nutrition of the gallbladder, bacteria obtained from the intestines were introduced into the gallbladder, symptoms identical with those seen in cases of intestinal obstruction were observed. Fluid from such a gallbladder

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injected into another animal was also toxic. In 1931, Williams,[3] an English surgeon, advanced the theory that intoxication seen in intestinal obstruction and ileus associated with peritonitis was similar to, and probably dependent upon, a bacillus Welchii infection. They seemed to get some results from the use of immune serum and bacillus Welchii antitoxin.

(C) Intoxication resulting from the absorption of normal secretions in an abnormal way or secretions which have not been toxified. Draper[3] believed that most of the intoxications are the result of the absorption of duodenal as well as the pancreatic secretions before they can be detoxified by the ileal cells.

(D) Intoxication produced by the absorption of perverted intestinal secretions. Whipple and Stone[3] and their co-workers believed that in obstruction the normal function of the cells of the duodenum was lost and that they secreted a substance which was toxic.

(E) Bacteriemia—the theory that the symptoms of intestinal obstruction were due to the absorption of bacteria. This theory was not generally accepted even though Generisch[3] found that in experimentally produced intestinal obstruction, Bacillus coli could be found in the peritoneum or blood, or both.

2. Non-toxic causes

(A) Dehydration. It was considered by some that the symptoms of intestinal obstruction were due to other factors besides intoxication. The one theory that was most commonly accepted was that of dehydration. Dehydration is always present in those cases with persistent vomiting. It has been found that by withholding fluids by mouth and giving fluids intravenously and intramuscularly, the patient can be carried along for some time before collapse, whereas if this is not done they soon die. This rapidly occurs in high obstruction. In lower obstruction this may take place but it is a much later development.

(B) Blood changes. Because of characteristic blood changes such as decrease in plasma chlorides, increase in carbon dioxide combining power of the plasma, and increased urea nitrogen, it was thought by some observers that certain, if not all, symptoms and signs depend upon these changes.

In 1937, Wangensteen[4] stated that we have advanced considerably from the long held conception that obstruction is essentially a toxemia occasioned by the absorption of a chemical poison of the nature of proteose or histamine from the bowel. The lethal factor in the obstructions of the upper reaches of the small intestines was definitely shown to be loss of fluids and chlorides through the agency of vomiting. A duodenal fistula was found to be fully as perilous as an obstruction in this region. The old conception that high obstruction is the most vicious is not outmoded by the knowledge of what saline solution can do to replace fluids and minerals lost by vomiting, nor by the demonstration of the favorable effect of relief of distension in colonic obstruction.

Effect

At the present time, the more important known physiological effect from obstruction is fluid and gaseous distention. The fluid consists of ingested liquids including saliva, gastric and pancreatic juice, bile and succus entericus. These have been estimated at 7,000 cubic centimeters per day (Rountree[4]). The chief source of gas is swallowed air, which is estimated at 70 per cent. The remainder of the gas is from fermentation and putrefaction in the bowel and that carried to the bowel through the blood. In consequence of the distention of the bowel, its wall becomes thinned, peristalsis is increased and propelling of its contents becomes ineffectual. The resistance of the intestinal muscle causes a colic-like pain.

Gamble[4] and his co-workers showed that the loss of electrolytes (sodium and chloride ions) was the chief factor in producing dehydration and that as a result of dehydration there was a concentration of the blood, with an increased concentration of the plasma proteins, and increased red blood cell count; also an increase in the viscosity of the blood. Hartwell and Hogue[3,4] and later Haden and Orr[3,4] demonstrated the physiological changes associated with dehydration and with the chloride loss. They suggested that this loss might be responsible for the toxic changes which their animals evinced.

In simple obstruction of the ileum we do not, as a rule, have such a marked loss of fluid and electrolytes and the administration of saline does not produce such striking effects. This is probably explained by the fact that the function of the absorptive area is not so greatly compromised. In obstructions of the colon, particularly low obstruction, there is little vomiting or fluid loss and the changes in the chemistry of the blood and body fluids are of secondary importance. In acute intestinal obstruction with venous obstruction and hemorrhagic infarction of the bowel wall, blood loss may be quite marked. Animals with any great amount of strangulation of the small intestines soon become profoundly ill and die in a short time. That is before there is significant loss of fluids by vomiting or a marked decrease of blood chlorides.

Aird of England, from certain experiments, concluded that long loop strangulations, involving half of the small intestines, are primarily dangerous from an internal hemorrhage standpoint. While as yet the rôle of fluid loss in acute intestinal strangulation cannot be accurately defined because of the varying results obtained by different investigators, it seems quite likely that only in very extensive strangulation is it the cause of death. Blalock has demonstrated that it requires a loss equivalent to 4 per cent of body weight to produce death. This is in an average sized man equivalent to two and one-quarter liters.

A greal deal of work has been done in regard to the rôle distention plays in intestinal obstruction. The normal and obstructed intraluminary pressure upon the various portions of the bowels has been studied; also, its effect upon the bowel wall. It has been found that the colon tolerates a relatively high tension whereas the duodenum tolerates a much lower tension, probably because of the greater vulnerability of its blood supply.

The effects of distention on absorption are less clearly understood. The absorption of water, glucose and certain alkaloids from the obstructed bowel is delayed. Because of intestinal stasis absorption by way of the lymphatics seems to be increased. Gatch and Culbertson[3] believe that devitalization of the bowel wall causes a loss of power of selective absorption by the mucosa, and permits the passage of toxic substances present in the obstructed bowel. Elman[2] in his studies has reported clinical cases in which he found that the sudden release of obstruction was followed by a deterioration in the patient's condition, owing, he believes, to absorption of toxins through reopened mesenteric channels. There seems to be no doubt that toxins play a part in intestinal obstruction, but investigators are unable to agree upon its source, whether it is derived from the bowel wall or from the intestinal contents; also, as to its chemical nature. The part played by toxins in intestinal obstruction is not well defined at the present time. However, there is reason to suppose that some such factor must operate in strangulating types of obstruction with their early onset of circulatory collapse.

Diagnosis

As previously stated, the diagnosis of intestinal obstruction is more rapidly and accurately made today than in the past. Fecal vomiting is practically synonymous with small intestinal obstruction.

The first question that arises is whether the obstruction is mechanical or functional, that is, spastic or paralytic. In mechanical obstruction we have the colicky cramp-like pains most intense at the height of peristalsis. The relation of pain and borborygmi is established by the stethoscope. In the paralytic type the pain is less colicky in character, the intestinal sounds are absent, or if present have no relation to the attacks of pain.

In the strangulating type of obstruction there is a rather abrupt onset with pain, as previously described, vomiting (particularly in high obstruction), increased pulse rate, low arterial pressure, cold clammy skin, and a rapid course so that the patient may be gravely ill in a few hours. The abdomen is tender and shows the signs of peritoneal irritation, localized and rebound tenderness, also muscle spasm. If these signs and symptoms are present, we feel fairly sure we are dealing with a strangulation type of obstruction in which the blood supply to the gut is involved. In simple obstruction, one in which the blood supply is not involved, the course is rarely so rapid and collapse is usually delayed for a considerable time unless the obstruction is very high. Tenderness of any degree is rare and only comes on much later when there may be interference with the venous return because of continued pressure.

As to the site of the obstruction, the history, onset, degree of vomiting and the general clincial picture help a great deal and in some cases establish very nearly the location. For example there is no gastric retention in colonic obstruction and fecal vomiting is always absent and vomiting is frequently entirely absent. Perforation of the colon due to the high tension occurs occasionally without vomiting. When we have considerable distention without nausea or vomiting, and without return of colored intestinal fluid upon gastric aspiration but accompanied by intestinal colic, we have an obstruction of the colon. Frequently, a rectal or vaginal examination will demonstrate the seat of the obstruction, or one may feel the collapsed loops of small bowel if the obstruction is high up and these have collapsed and fallen into the lower pelvis.

In obstruction of the lower end of the large intestine not only may the horseshoe-shaped outline of the colon stand out plainly, when the bowel is in rigid spasm, but even the pouches of the gut may be seen. When the cecum or lower end of the ileum is obstructed the distension is in the lower central region, and during spasm the coils of the small bowel may be either obliquely or transversely placed, the so-called "ladder pattern."

The most reliable findings in direct lower bowel obstruction are obtained by the use of the x-ray. It has been repeatedly shown that gas and fluid levels in the small bowel become characteristic in these direct lower bowel obstructions in three to six hours, and it cannot be emphasized too much that an early so-called "scout" plate be made.

It must be borne in mind that early diagnosis is very important. Donaldson,[1] in a review of the statistics, found that the mortality even in simple obstruction in those that lasted over forty-eight hours was very high (84.6 per cent); in those that were allowed to go over seventy-two hours the mortality was 100 per cent. When operation was done under forty-eight hours (average in his series was thirty-two hours) the mortality was only 12.5 per cent.

The differential diagnosis of obstruction of the bowel will not be discussed. However, it must be differentiated from such conditions as: acute enteritis, peritonitis, acute pancreatitis, mesenteric thrombosis or embolism, lead poisoning, and hernia.

Treatment

Treatment must vary according to the type of obstruction involved. The most clear cut therapeutic indication is to restore the continuity of the intestinal tract, but in certain cases it may be advisable to achieve this end indirectly rather than by immediate operative procedure. In simple mechanical intestinal obstruction the first step in treatment is the replacement of fluid and electrolytes lost by vomiting. This loss may vary considerably. In high obstruction it may be great and in colonic obstruction, as a rule, it is very slight. Enough fluids should be given to insure a daily output of 700 c.c. to 1,000 c.c. of urine.

The second step is the relief of the distention of the obstructed loops and prevention or relief of the circulatory changes which follow in the wake of distention. It is here that one of the single most important advancements in recent years has been made by Wangensteen[4] and his co-workers. His method of a simple water-siphon suction apparatus which applies a negative pressure to an indwelling duodenal tube has been of incalculable value, and today it is in general use throughout the country.

There are two types of simple obstruction in which decompression of the bowel above the site of obstruction alone usually permits the continuity of the bowel to be restored. These types are: (1) simple mechanical obstruction occurring in the early postoperative period caused by fibrinous adhesions; and (2) late postoperative obstruction caused by fibrous adhesions. These were formerly treated by enterostomy, but Wangensteen[4] has definitely shown that the large majority are more satisfactorily treated by decompression without surgery. In the colon, if the ileocecal valve is competent, we have a closed loop obstruction and early relief of tension is urgently needed. A cecostomy or colostomy under local anesthesia is indicated.

Even in early simple obstruction preliminary decompression for a period of a few hours may greatly relieve the distention and thus aid in the operative procedure. It is generally conceded that adequate blood transfusion is urgently indicated in all strangulating obstructions in which we have any significant blood loss, as indicated by increased pulse rate, low hemoglobin, and the condition of the patient in general. In short loop obstruction, blood loss is not important.

Fine[5] and his associates have investigated the use of oxygen in obstruction and have found that concentrations as high as 90 per cent can be used with satisfaction. They did not find that such high concentrations caused desquamation of bronchial epithelium and predisposed the patient to pneumonia as was formerly thought to be the case. By reducing the amount of nitrogen in the inspired air the nitrogen tension in the blood plasm is similarly decreased and nitrogen in the bowel lumen, which ordinarily does not diffuse readily through the intestinal wall because of the high tension of nitrogen in the plasma, slowly diffuses into the venous blood and is exhaled. This, together with an inlying duodenal tube to remove the swallowed air, is of great value.

Operative interference should be undertaken very early in short loop strangulations as perforation and peritonitis occur comparatively early. The viability of the bowel may be determined by the return to normal color of the affected loop, the presence of mesenteric pulsations and occurrence of peristalsis. When resection is to be done it is safer to exteriorize the loop and reestablish the continuity of the bowel later, when the general condition of the patient is improved. In strangulation, as in simple obstruction, the procedure which promises to give relief with minimal manipulation and with the least chance of peritoneal contamination is the safest. Sterility of the peritoneum must be preserved. Contamination or spillage is synonymous with failure.

Summary

We are not drawing any conclusions in this paper. Much progress has been made in the diagnosis, treatment, and understanding of intestinal obstruction. X-ray has aided in the diagnosis of these cases and nasal suction (Wangensteen's method) has done much in the treatment of intestinal obstruction.

The parenteral administration of fluids and the use of high concentration of oxygen have reduced mortality. However, research and experimentation still remain to be done, especially as to the cause of death in these cases.

PART II

In the preceding portion of this article the subject of obstruction of the bowel was dealt with generally and all parts of the intestine affected by this condition included. In the remaining portion of the paper, because of the nature of the material in an "acute" hospital and because only those cases definitely obstructed were chosen, our study automatically narrows itself down to a consideration of acute obstruction of the ileum which is subject to ileus following peritonitis, to adhesions with inflammatory areas, to handling during surgery, to volvulus of its loops and its mesentery and to some extent to new growths.

In the second part of this paper we included intussusception and strangulated hernias where clinical evidence of obstruction obtained.

The following group of statistics are made from the hospital records just as they appear there, reading from the front to the back of the record.

Operated Cases of Obstruction of Bowels

(Asbury Hospital—1924-1931)

This group of cases numbered eighty-six, with fifty-seven cures and twenty-nine deaths, giving a 35 per cent mortality.

The working diagnoses made were: obstruction, appendicitis, cholecystitis, intussusception, volvulus, salpingitis, ovarian cyst, strangulated postoperative hernia, and various other surgical diagnoses of abdominal conditions appeared to the number of twenty.

The final diagnoses in this group were: obstruction, appendicitis, volvulus, strangulated postoperative hernia, peritonitis, mesenteric volvulus, cholecystitis, intussusception, ruptured appendix, and other surgical conditions obtained to the number of twenty-five.

The operations performed upon this group of patients where obstruction of the bowels was dealt with were: liberation of adhesions, appendectomy, enterostomy, ileostomy, reduction of strangulated hernia, reduction and repair of various other hernias, drainage of appendiceal abscess, salpingectomy, colostomy, reduction of intussusception, cholecystectomy, reduction of volvulus, suspension of uterus, resection of ileum, and other surgical operations in the abdomen to the number of thirteen.

The complications found were: paralytic ileus, obstruction of bowels, fecal fistula, peritonitis, infected wound, pneumonia, postoperative hemorrhage, separation of wound, gastric dilatation, toxemia, pulmonary embolism, and other medical and surgical conditions complicated this group to the number of ten.

Ages of the group ranged from one to eighty years with an average of forty-three.

Sex distribution showed females fifty-five and males thirty-one.

Autopsy diagnoses in the fatal cases followed by postmortem examinations were as follows: peritonitis, obstruction, bronchopneumonia, cloudy swelling of the liver, kidney and spleen, paralytic ileus, postoperative hemorrhage, gastro-enteritis, dilatation of stomach, gangrenous appendicitis, coronary sclerosis.

Non-surgical decompression was used preoperatively and postoperatively in most of the cases. No nasal suction of the syphon and almost continuous type that is in use today was employed. The duodenal tube passed through either mouth or nose and irrigated by means of a syringe was used fourteen times. Stomach lavage was resorted to twenty-three times for relief of vomiting and distension. Other agents used for the purpose of decompression were: rectal tube, pituitrin, hot turpentine stupes, hot abdominal packs, milk, and molasses enemas, and other agents, for example cold abdominal pack and ergot dry heat were used once each. Enterostomy, a form of surgical decompression, was performed three times in addition to the previously named operations used for the relief of these patients.

Abdominal operations had been previously performed upon fifty-two patients in this group while thirty-four had had no surgical treatment. Eleven of the obstructions followed operations only a few weeks or days before. In eleven other cases obstruction occurred several months to two years after operation in and upon the abdomen. Thirty of this group had had previous operations two or more years before obstruction.

In this small group of bowel obstructions the list of previously performed operations were: appendectomy, salpingectomy, cholecystectomy, drainage of appendiceal abscess, ovariectomy, hysterectomy, myomectomy, obstruction, herniotomy, exploratory laparotomy, suspension of uterus, and drainage of ovarian cyst.

The symptoms listed on the records of this series of cases were: pain, vomiting, distension, nausea, tenderness, inability to move bowels or to pass gas from bowel, cramps, rigidity, palpable mass, hernia, spasm, chills, and reversed peristalsis.

A very high percentage of this group were diagnosed from clinical findings when first seen. However, the x-ray used in twenty-one cases was diagnostic nineteen times and negative twice. When there was a definite need of confirming other findings, x-ray furnished this information in nearly every case where it was used.

Review of anesthesia used in this earlier period of our study showed general anesthesia the choice in 50 per cent of cases, or forty-four times. Local anesthesia, no doubt, was given preference in bad risk cases, where it was used seventeen times. Spinal anesthesia, most excellent in obstruction cases, was selected thirteen times. Combinations of different types of anesthesia, one usually preceding the other, were used fourteen times.

The time from the onset of the obstruction to its relief varied from one to thirteen days, with an average of two days, this average time being short because many patients were relieved immediately by operation.

The number of days spent in the hospital by the patients in this group varied from one to seventy-four, with an average of eighteen days.

Unoperated Cases of Obstruction of Bowels

(Asbury Hospital—1924-1931)

The number of patients with obstruction of the bowels so diagnosed and not operated upon for the reason that they recovered without operation or were beyond the help of surgery, was twenty-nine. Seven of these died and three came to autopsy, making the mortality 24 per cent and autopsy percentage 42.

The number of days spent in the hospital ranged from one to fifteen with an average of four days.

The working diagnoses were: obstruction, intussusception, fecal impaction, cholecystitis, toxemia, pelvic tumor and acute abdomen.

The final diagnoses were: obstruction, intussusception, fecal impaction, cholecystitis, toxemia, pelvic tumor, acute peritonitis, and diverticulum of sigmoid.

The complications in this unoperated group were: septicemia and bronchopneumonia.

The end-result was twenty-two cures and seven deaths.

The ages varied from three to eighty-five years with an average age of forty-eight, and with the greatest number in the sixth decade in both sexes. The fourth decade was next in number in the females and third and fourth decades the same in both sexes. Seven males and twenty-one females made up this group.

The decompression measures used in this series were: hot stupes, milk and molasses enema, pituitrin, rectal tube, dry heat, Nobles' enema, and lavage of stomach.

Eleven of this group had had previous abdominal operations and seventeen none. Two had been operated upon recently and nine more than two years before the obstruction. The eleven patients mentioned had been subjected to the following operations: appendectomy, cholecystectomy, resection of ileum, herniotomy, for ovarian cyst, and laparotomy.

The symptoms listed on the records of this small unoperated group were: pain, obstipation, vomiting, tenderness, distention, nausea, cramps, ventral hernia, and abdominal rigidity.

The time from onset of obstruction to its relief in the twenty-two cases that were cured varied from one to five days with an average of two days.

X-rays employed for help in diagnosis were negative four times, diagnostic of obstruction four times, and no x-ray was done in twenty-one cases.

The autopsy diagnoses in the three cases that came to postmortem were: gangrenous appendicitis, peritonitis, carcinoma of rectum, obstruction of bowels, strangulated ventral hernia, swelling of spleen, liver, and kidneys, necrosis of bowel, cloudy swelling and fatty metamorphosis of liver.

Operated Cases of Obstruction of Bowels

(Asbury Hospital—1932-1938)

One hundred and five patients with obstruction of the bowels were operated upon in the Asbury Hospital during the period of years from 1932 and 1938 inclusive.

This period shows the beginning of the use of nasal suction and its establishment almost as a routine in the decompression of the obstructed cases in this hospital. As was shown in the statistical review of the patients with obstruction who were operated upon during the 1924-1931 period, many other accepted methods of decompression have been in use in the hospital since its opening in 1924. However, it seems logical in reviewing obstruction cases to feature decompression preoperatively and postoperatively and especially nasal suction.

The hospital records of the 1932-1938 group of operated cases show that a working diagnosis of obstruction was made sixty-six times for that intestinal trouble alone, and that it shared this tentative diagnosis with appendicitis, intussusception, fibroid tumor of uterus, strangulated hernias of different types, cholecystitis, volvulus, and fifteen other surgical conditions of various types.

A final diagnosis of obstruction of the bowels was made seventy-eight times, together with the above mentioned conditions described in the working diagnosis the same number of times. Final diagnoses in this group also listed paralytic ileus, peritonitis, Meckel's diverticulum, and various other surgical and medical conditions that accompanied and complicated the obstruction.

The operations performed in this series of cases were as follows: liberation of adhesions, appendectomy, different types of hernia repair, reduction of intussusception, salpingectomy, enterostomy, cholecystectomy, oöphorectomy, colostomy, resection of bowel and other abdominal operations to the number of seventeen.

The complications in these obstruction cases were: paralytic ileus, infected wound, bronchopneumonia, peritonitis, cystitis, streptococcic sore throat, lobar pneumonia, and other complications to the number of six.

The end-results in these cases were seventy-nine cures and twenty-six deaths, making a 25 per cent mortality. Thirteen autopsies were performed, 50 per cent.

Autopsy diagnoses included obstruction, postoperative ileus, peritonitis, broncho-pneumonia and others to the number of ten.

The ages ranged from infancy, where most of the intussusception cases were found, to past the age of eighty, where many of the strangulated hernias were encountered. An average of forty years obtained.

There is a similarity of ages in both sexes when these cases are divided into decades, with the third, fourth, and fifth decades having the greatest number, the females predominating two to one over the males. In the 105 cases there were seventy females and thirty-five males.

Of the different methods of non-surgical decompression used during the 1932-1938 period, the one most frequently used was nasal suction. This form was used fifty-seven times preoperatively and postoperatively. Other agents were: hot turpentine stupes, rectal tube, Nobles' enema, milk and molasses enema, dry heat, duodenal tube, rectal suction, pituitrin, prostigmine, and enterin. Nasal suction has replaced the old duodenal tube with syringe irrigation that was so useful in the pre-suction days.

The history of previous operations was the outstanding etiological factor in this group as in all obstructions. Fifty-nine patients had had abdominal operations. Twelve of this number developed obstruction within a few days, postoperatively; eight of the number within a few weeks or months, and thirty-nine suffered from obstruction more than two years after abdominal operation. The remaining forty-six of these patients with intestinal obstruction had had no previous abdominal operation.

The different operations previously performed upon the patients in the group were: appendectomy, salpingectomy, ovariectomy, hysterectomy, herniotomy, tumor, drainage of appendiceal abscess, cholecystectomy, and other abdominal operations to the number of ten.

The symptoms listed were: pain, vomiting, nausea, inability to obtain bowel movements, palpable or visible mass, hernia, tenderness, rigidity, distended abdomen, cramps, bloody stools, restlessness, spasm, and chills.

There has been a steady increase in the use of the x-ray as a diagnostic aid in obstruction during the seven years of this period. It was used in fifty-three of the 105 cases and proved to be diagnostic in forty-nine and negative in four.

Anesthesia used in the operations for relief of obstruction were: local, general, spinal, and combined anesthesia. Their selection depended both upon the condition of the patient and the custom of the operating surgeon.

The days in hospital ranged from one to sixty-three, with an average of seventeen days.

Investigation of the individual records showed the time from the onset of obstruction to its relief to vary from one to ten days. Many were immediately relieved at operation. This was especially true of the strangulated hernias and intussusception cases. The average length of time was two and one-half days.

Twenty-six patients died and seventy-nine were relieved of obstruction and cured.

Unoperative Cases of Obstruction of Bowels

(Asbury Hospital, 1932-1938)

This group numbered thirty-four with twenty-six cures, eight deaths, and one autopsy; a 24 per cent mortality and 12 per cent autopsies performed.

The days spent in the hospital ranged from one to twenty-nine with an average of five days.

The working diagnoses in this group were: obstruction, intussusception, kidney stone, coronary disease, carcinoma of sigmoid, appendiceal abscess, fracture of arm, and fracture of leg.

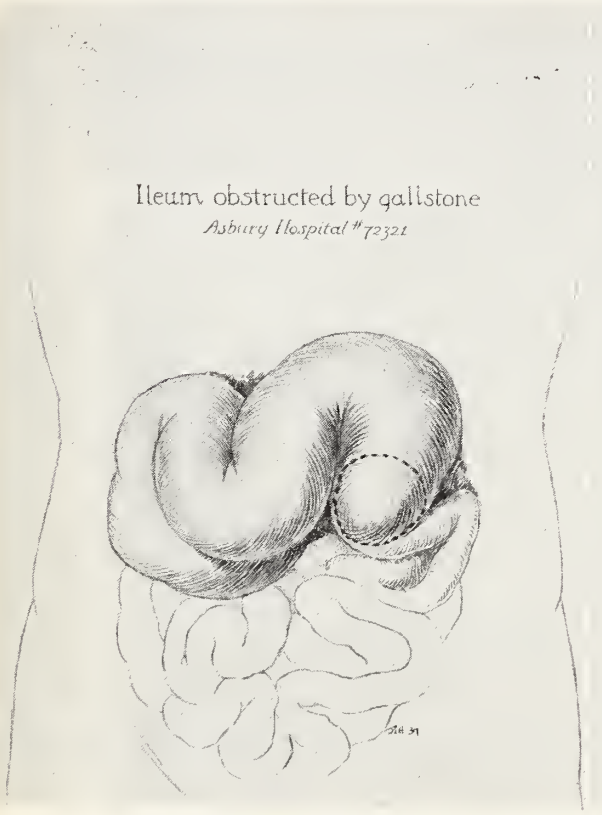

Fig. 1.

The final diagnoses were: obstruction, intussusception, cardiac arrhythmia, together with those included in the working diagnoses.

The complications found in this group during illness were: shock, peritonitis, broncho-pneumonia, coronary disease, pulmonary atelectasis, and obstruction.

The end-results in the thirty-four cases were: twenty-six cures and eight deaths.

Ages in this group ranged from one to eighty-five years with an average of twenty years. There were twenty-one females and thirteen males with this condition distributed about evenly throughout the nine decades in both sexes.

Autopsy diagnoses were: obstruction, ruptured appendix, edema of lungs, and strangulated intra-abdominal hernia.

Decompression was used as follows: nasal suction, turpentine stupes, Nobles' enema, milk and molasses enema, hot packs, dry heat, pituitrin; no decompression whatever was used in twenty-five cases. There was a steady increase in the use of nasal suction.

Previously eighteen of this group had been operated upon at some time before the obstruction: thirteen recently and thirteen more than two years before. These operations were: appendectomy, salpingectomy, adhesions, laparotomy, explorations, hysterectomy, exploratory for bullet, ovariectomy, and cholecystectomy.

The symptoms listed on the records were: pain, tenderness, obstipation, vomiting, distension, rigidity, nausea, and mass in abdomen.

X-ray was used twenty-seven times, being negative nine times and diagnostic eighteen times.

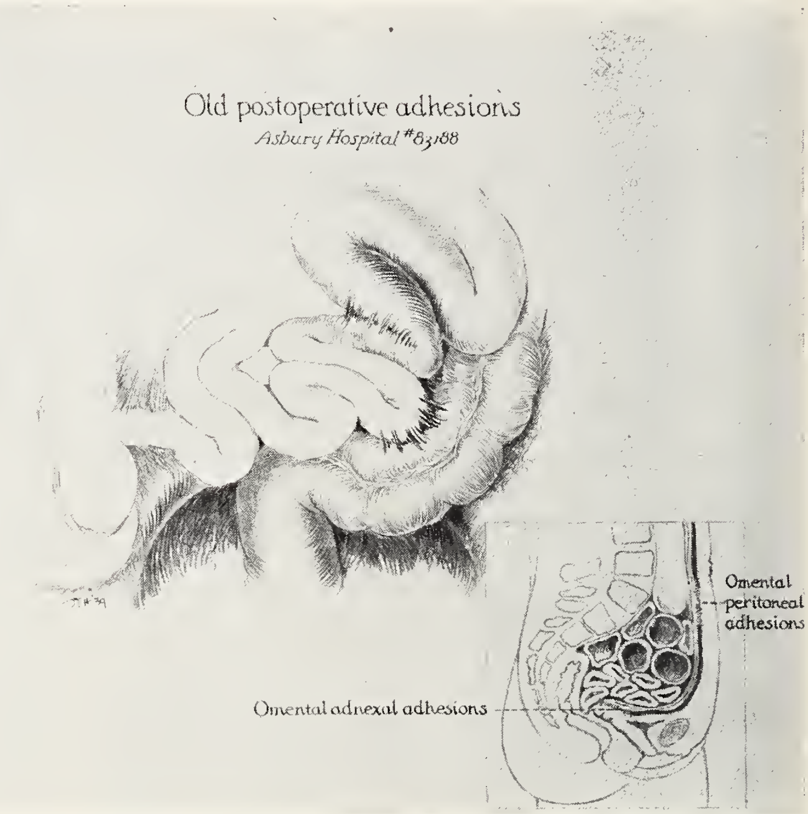
Old postoperative adhesions
Asbury Hospital #83188
Omental peritoneal adhesions
Omental adnexal adhesions

Fig. 2.

Onset to relief ranged from one to three days. More than half were relieved of obstruction in one day, the average being one and three-tenths days.

Case 1.—Series 1924-1931. A white woman, aged sixty-five, was admitted to the hospital with a working diagnosis of intestinal obstruction, having been ill for about forty-eight hours. The clinical findings were those of complete obstruction in spite of a negative x-ray. Operative findings (Fig. 1) were that of a gallstone in the lumen of the ileum in the left lower abdominal quadrant. This was removed and the intestine closed. This patient had had no previous surgery and recovery was uneventful.

Case 2.—Series 1924-1931. A white woman, aged thirty-seven, was admitted to the hospital with a working diagnosis of intestinal obstruction and clinical findings the same. X-ray findings were positive for this condition. The liberation of adhesions was done under general anesthesia and the operative findings were: a band running from the ileum to a point two feet from ileocecal valve to sigmoid colon and a short band between two loops of ileum; thirty inches of ileum was collapsed (Fig. 2). This patient had had previous operation two years ago consisting of a salpingectomy, oöphorectomy and cholecystectomy. No complications arose and after thirteen days of hospitalization patient was discharged as cured.

Case 3.—Series 1924-1931. A white man, aged twenty-two, was admitted to the hospital one week previous and operated upon for acute appendicitis with rupture and peritonitis. Course subsequent to appendectomy very unsatisfactory. Diagnosis of obstruction with peritonitis and postoperative ileus was made on second day of operation. The operative findings were: peritoneum inflamed, cavity containing purulent fluid; intestines distended and inflamed but no evidence of mechanical obstruction (Fig. 3). An ileostomy was performed. The patient died at the end of nine days.

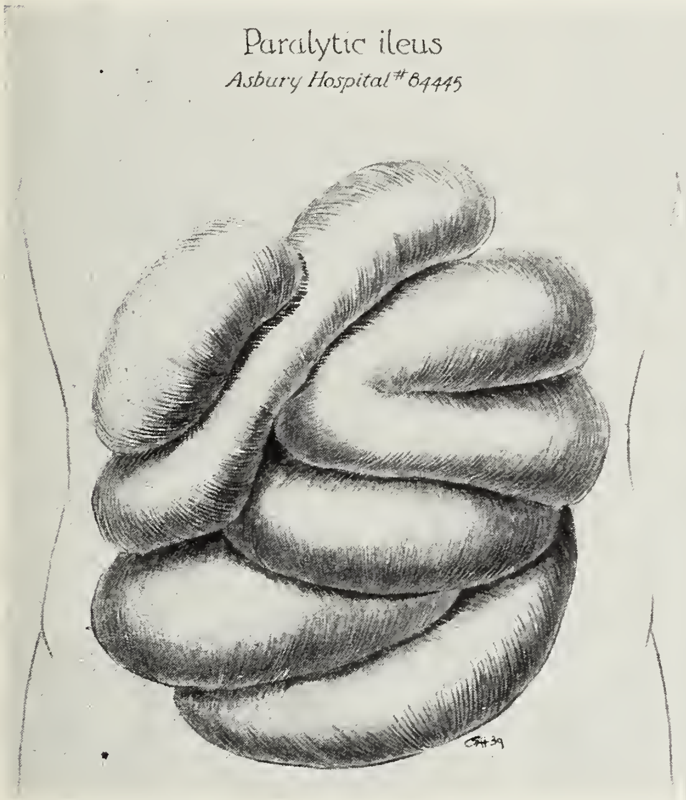
Paralytic ileus
Asbury Hospital #84445

Fig. 3.

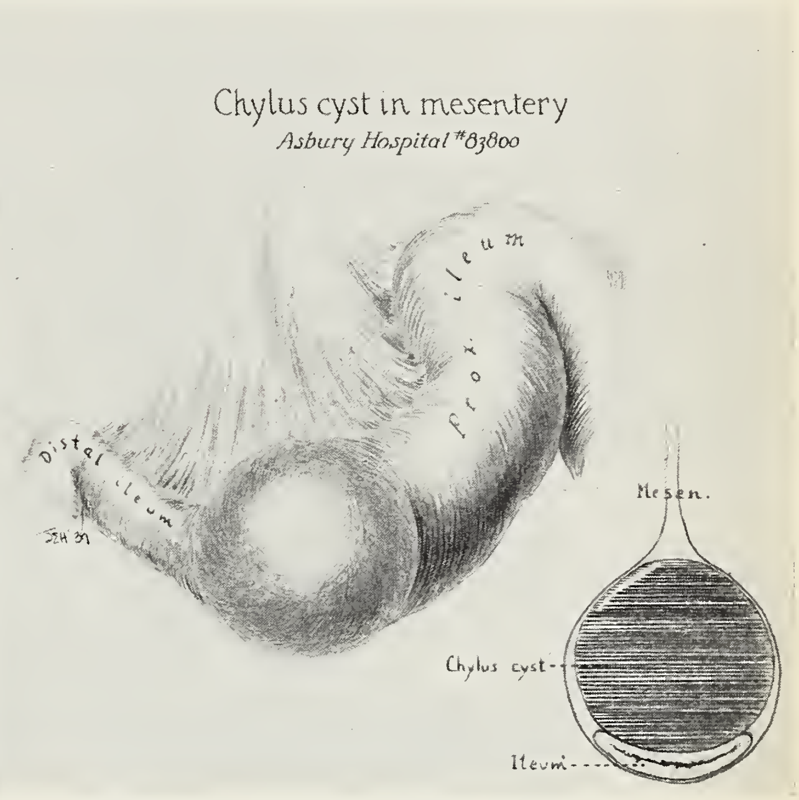
Chylus cyst in mesentery
Asbury Hospital #83800

Fig. 4.

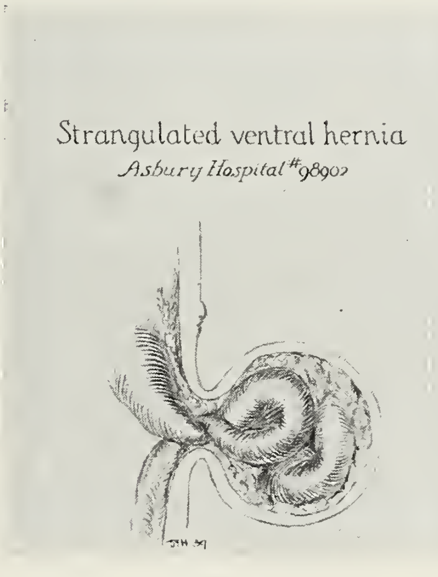
Strangulated ventral hernia
Asbury Hospital #98902

Fig. 5.

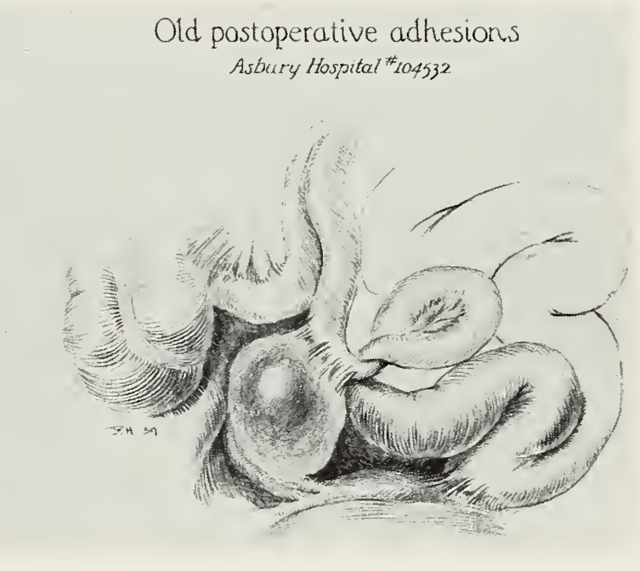
Old postoperative adhesions
Asbury Hospital #104532

Fig. 6.

Case 4.—Series 1924-1931. A white boy, aged eight, was admitted to the hospital with a working diagnosis of intestinal obstruction. The clinical findings were those of a complete obstruction and the x-ray findings were positive for this condition. The operative findings were: under operative scar a mass the size of grapefruit was found attached to small intestine and mesentery. The bowel above the mass was distended and it was collapsed below (Fig. 4). The mass and eight inches of bowel were removed. An end-to-end anastomosis was performed. This patient had had an appendectomy one year previous. Complications in this case were parotitis and contraction of flexors of wrists. He was discharged as cured after twenty-nine days of hospitalization.

Case 5.—Series 1932-1938. A white woman, aged 52, was admitted to the hospital with a working diagnosis of strangulated hernia. The clinical findings were those of a complete obstruction and no roentgenograms were made. The patient was removed to the operating room and under spinal anesthesia liberation of adhesions and repair of hernia were done. The operative findings were a strangulated ventral hernia the size of a large grapefruit, containing loop of ileum, portion of omentum and mesentery (Fig. 5). Previous operation was for an ovarian tumor ten years ago. No complications arose and after twenty-one days of hospitalization this patient was discharged as cured.

Case 6.—Series 1932-1938. A white woman, aged thirty-nine, was admitted to the hospital with a working diagnosis of gastro-intestinal ptosis and obstruction. The clinical findings were those of a complete obstruction and the x-ray findings were diagnostic. The patient was removed to the operating room and under spinal anesthesia the liberation of adhesions and reduction of volvulus were performed. The operative findings were: dilated loop of small intestine with bloody serous fluid; large and small colon in pelvis; a point of ileum two feet from ileo-cecal valve was attached to ovary of right side and there was a full turn volvulus present (Fig. 6.) A salpingectomy had been performed two years ago. Nasal suction was used preoperatively and postoperatively. The patient had no complications and after sixteen days of hospitalization was discharged as cured.

Case 7.—Series 1924-1931. A white woman, aged thirty, was admitted to the hospital with a working diagnosis of obstruction of small intestine. The clinical findings were those of reversed peristalsis and fecal vomiting. No roentgenograms were made. The operative findings were as follows: entire small bowel greatly distended with gas; mesenteric volvulus, a complete turn; ileum adherent to horns of uterus; omentum adherent to ileum and anterior peritoneal surfaces. An ileostomy and liberation of adhesions were performed under general anesthesia. This patient had had a salpingectomy two years previously. A complication of fistula arose. However, after eighteen days in the hospital she was discharged as cured.

Case 8.—Series 1924-1931. A white man, aged twenty-one, was admitted to the hospital with a working diagnosis of obstruction of the bowel, and clinical findings were those of a complete obstruction. No roentgenograms were made. The operative findings were as follows: a loop of the terminal ileum adherent to upper angle of appendectomy scar and twisted upon itself one full turn; another portion of the ileum was adherent the entire length of the appendectomy scar, causing a volvulus of the mesentery of the small bowel. Liberations of adhesions, reduction of volvulus, and an enterostomy were performed under general anesthesia. This patient had had an appendectomy three months previously. Complications were ileus and peritonitis and the patient died after one day in the hospital.

Case 9.—Series 1924-1931. A white girl, aged fourteen, was admitted to the hospital with a working diagnosis of intestinal obstruction with clinical findings the same. No roentgenograms were made. Operative findings were: ileum eighteen inches from ileocecal valve attached to head of cecum, loop collapsed; loop twelve inches from valve attached to ascending colon and anterior peritoneal surface; omentum adherent to this attachment. The operation was the liberation of adhesions, untwisting the most distant volvulus and separation of adhesions, all of which showed ileum torn apart twelve inches from ileo-cecal valve. An end-to-end anastomosis was done. Decompression used was duodenal tube and syringe. This patient had had an appendectomy six months previously. No complications arose and after twenty days of hospitalization was discharged cured.

Case 10.—Series 1932-1938. A white man, aged seventy-seven, was admitted to the hospital with a working diagnosis of strangulated hernia. The clinical findings were those of a complete obstruction. No roentgenograms were made. The patient was removed to the operating room and under spinal anesthesia liberation of adhesions, reduction of volvulus and repair of hernia were done. The operative findings were: hernial sac filled with black fluid; bowel dark and injected; a loop of small bowel in sac in complete volvulus. A final diagnosis of strangulated hernia and obstruction of small intestine with volvulus was made. This patient had had a prostatectomy four years previously. No complications arose and after thirty-one days in the hospital was discharged as cured.

Case 11.—Series 1932-1938. A white woman, aged thirty-six, was admitted to the hospital with a working diagnosis of bowel obstruction with clinical findings those of complete obstruction. X-ray findings were diagnostic. Under spinal anesthesia a lateral anastomosis and a diverticulectomy were done with the operative findings showing the small bowel distended and diverticuli encircling bowel at proximal end of ileum. Nasal suction was employed on this patient. She had had previous operation for the liberation of adhesions several years ago. No complications arose and this patient was discharged as cured after thirty-nine days of hospitalization.

Case 12.—Series 1932-1938. A white woman, aged 27, was admitted to the hospital with a working diagnosis of spastic stomach with clinical findings those of complete obstruction. X-ray findings showed obstruction at terminal ileum. Liberation of adhesions was done under general anesthesia and the operative findings were those of terminal ileum attached to fundus of uterus one foot from ileo-cecal valve and a volvulus one complete turn held in place by newly formed adhesions. A final diagnosis of mechanical obstruction of bowels with volvulus was made. Nasal suction was used preoperatively and postoperatively. Salpingectomy had been performed eight years ago. No complications arose and the patient was discharged as cured after thirteen days.

Case 13.—Series 1932-1938. A male infant, one year of age, was admitted to the hospital with a working diagnosis of intussusception with clinical findings showing obstruction due to intussusception. Reduction of intussusception was done under general anesthesia and the operative findings were those of intussusception of ileum through ileocecal valve into the large intestine, running as far as the sigmoid flexure. This patient had had no previous operation and after thirteen days in the hospital he was discharged as cured.

Case 14.—Series 1932-1938. A white woman, aged sixty-six, was admitted to the hospital with a working diagnosis of strangulated ventral hernia with clinical findings showing a completely obstructed condition. No roentgenograms were made. Liberation of adhesions, reduction of volvuli and repair of hernia were done under spinal anesthesia. The operative findings were as follows: a loop of ileum, portion of mesentery and omentum were found adherent in mass the size of a large grapefruit; a complete volvulus of the ileum and one-half turn volvulus of the mesentery. This patient had had an appendectomy performed and two operations for strangulated hernia previously. Nasal suction was used post-operatively. No complications arose and the patient was discharged after twenty-one days as cured.

Case 15.—Series 1932-1938. A white woman, aged thirty-five, was admitted to the hospital with a working diagnosis of acute appendicitis and with clinical findings those of a complete obstruction. X-ray findings, however, were negative. Under combined anesthesia the liberation of adhesions and an appendectomy were performed with the operative findings as follows: loops of ileum greatly distended at cecum; large adhesive band across terminal ileum. Nasal suction was used in this case and the patient made an uneventful recovery, being discharged after nine hospital days.

Summary of Statistical Study

A 10 per cent decrease in mortality appears in the nasal-suction period of this statistical study as compared with the prenasal-suction period.

This improvement is, no doubt, due to such factors as better and more frequently used roentgen ray studies for diagnosis; a more surgically-minded public than in former years, resulting in the surgeon being called earlier in the illness.

Most important of all, however, is nasal suction for decompression of the distension of acute obstruction which enables us to make our patient comfortable and operable and also to keep him free from distention postoperatively.

All of the important items contained in the surgical records were listed in the order that they appeared upon the records for the purpose of showing the work done with this type of obstruction over a period of fifteen years.

The period from 1924 to 1931, inclusive, was the prenasal-suction period. The period from 1932 to 1938, inclusive, was the nasal-suction period. Decompression is featured in a very broad sense, including every agent that was applied for the purpose of relieving distention, even including the operation that usually terminated the obstruction.

A few of the very interesting and typical cases are presented in some detail with the artist's interpretation of the surgeon's dictated findings at operation.

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THE MALE HORMONES*

MAX H. HOFFMAN, M.D.
Saint Paul, Minnesota

THE male of the human species has apparently always been interested in his gonads. The easy accessibility of these organs and their anatomical relationships appears to have intrigued the curiosity of those with surgical minds, even long before Biblical days. The peculiar characteristics associated with castration in the male apparently establish the first clinical picture of endocrine dysfunction. Symptoms and signs developing after castration led to the association of similar findings in uncastrated individuals as being related to the gonads.

The testicles have always been regarded as the seat of virility and strength in the male, although modern researches have shown that this is not always the case. However, loss of the testicles produces such a profound impression upon the psyche of the individual that the modern psychoanalyst has evolved what he calls the castration complex in an attempt to explain many of the psychoneurotic manifestations that he frequently encounters.

I need not at this time recall in detail the numerous attempts to substitute or replace the function of the absent or poorly working gland. Scientists, and others not scientists, for several hundred years have attempted by various means to achieve this end. Gland grafting, goat gland implantation, ligation of the ductus deferens and the production of testicular extracts are only a few of the methods that have been tried. It is only recently that we have had available a potent male sex hormone.

The development of the sex hormones as well as several of the other hormones has been a triumph of biochemistry. The isolation identification and production of these hormones is a story as fascinating as any romance.

In 1927, McGee studied the effects of a lipoid fraction of the bull's testis on the growth of a capon's comb. This was quickly followed by advances in the study of the androgens. The first androgen that was isolated from the urine was identified as dehydroandrosterone.

At first it was thought that these substances found in the urine were those that occurred in the testis. However, it was soon found that the active substance found in the testis was destroyed by alkali, whereas that in the urine was not. Therefore, the testicular hormone must be different. In 1935, Laquer isolated testosterone from the testis of the bull and this was found to be five to eight times as effective as androsterone in stimulating the growth of the capon's comb. One hundred pounds of bulls' testis produced only 4 to 10 mg. of testosterone. The testis, then, is a factory and not a storehouse of this hormone.

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*From the Miller Hospital, Saint Paul, Minnesota. The laboratory work in the cases reported was done in the Laboratory for Urinary Sex Hormone Studies, WPA project 665-71-3-3. The testosterone propionate used in these cases was Perandren, in part supplied by the kindness of Ciba Co. Read before the annual meeting of the Minnesota State Medical Association, Minneapolis, Minnesota, June 1, 1939.

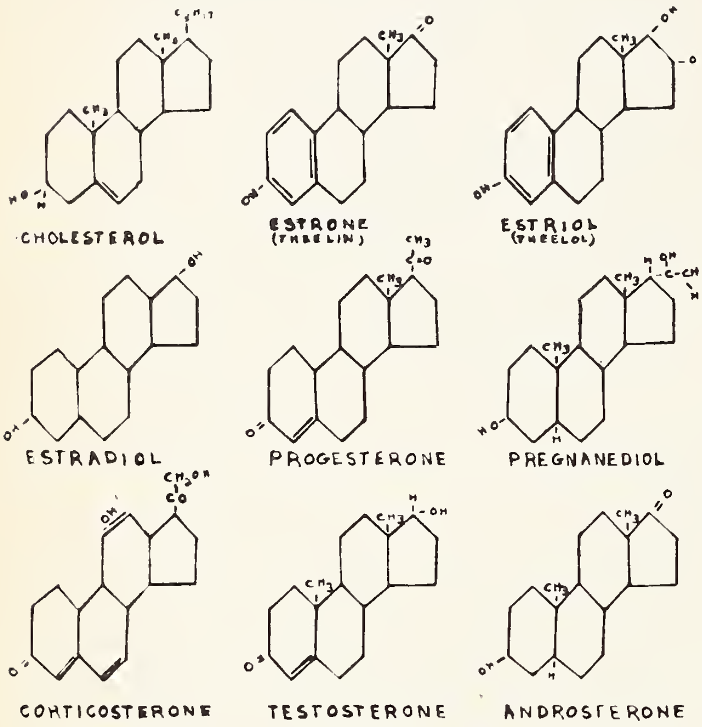

Chart 1.

The male hormones are chemically closely related to the female sex hormones. The mother substance of all the hormones is most likely cholesterol, and this substance forms the base for the synthetic production of the male hormones. There have been numerous substances with male hormone properties produced synthetically and a few of them with both male and female characteristics.

It is of some practical importance that the physician be acquainted with the chemistry and occurrence of the various sex hormones. Of the male hormones only two have been identified in the urine: anderosterone and dehydroandrosterone. Of these two, one, androsterone, is of importance only because the international unit of the male hormone is defined as being 0.1 mg. of androsterone. The international unit of male and female hormones has been established by the League of Nations division of public health. The only male hormone of therapeutic importance is testosterone. It has been found that the propionic ester form is twelve to seventeen times as effective as testosterone itself. The now commercially available preparation is testosterone propionate. Another hormone with male properties has been isolated from the adrenal gland cortex and designated as adrenocorticosterone. From 2,200 pounds of bulls' adrenals 26 mg. of this hormone has been isolated. The male hormone present in the urine of castrates in small amounts probably comes from this source.

The average daily excretion of the male is around 50 to 60 bird units of androgenic substance (Male Hormone) a day and about 90 to 120 international units of estrogenic substances (Female Hormone). The female excretes, on an average, about 40 to 50 bird unit androgenic substances and 180-360 international unit of estrogenic substances. There are rather wide variations from these figures in a few normal cases, but the findings are helpful in the diagnosis of hypogonadal conditions and hypergonadal states, especially those associated with hyperfunctioning adrenal cortical tumors. It is interesting to note that female castrate excretes a small amount of male hormone which, as I stated before, most likely comes from the adrenal cortex.

The urine of males and females contains both sex hormones in fairly equal amounts, and for this reason I would like to discuss very briefly the female sex hormones. It has been felt by some investigators that the ratio between the male and the female urinary sex hormones is of equal if not more importance than the total amount of the male hormonal substance present. The ovary of the female contains two hormones, the estrogonic hormone in the form of estradiol, and the luteal known as progesterone. The urine of the non-pregnant female contains two forms of estrogenic substance—esterone (Theelin), and estriol (Theelol). The urine also contains a derivative of progesterone known as pregnanediol.

Just what are the effects of the male hormone? When we speak now of the male hormone we are referring to the substance commercially available and designated chemically as testosterone propionate. In adequate doses this substance will stimulate libido in the eunuchoid individual causing an increase in the frequency of erections. It will cause a temporary enlargement of the prostate gland and increase in the consistency of the penis, and if the doses are large enough, painful priapism may be produced. At times the increased blood supply to the penis and scrotum is evidenced by a definite redness of the scrotal skin and redness of the glans penis. In some cases it will cause a return of facial and pubic hair growth where it has been lost, and a deepening of the voice.

Kenyon, who has carried out metabolic studies in four cases of eunuchoidism, found a decrease in the excretion of urinary nitrogen and decrease in sodium excretion and a gain in weight following the injection of testosterone propionate. In some cases definite edema developed, probably due to the sodium retention.

All the above effects will disappear at varying periods following the injections. The effect of the injections may last for some time, in my experience the longest period being approximately two months and the shortest period two weeks.

The following cases illustrate fairly well the effect of the hormone:

Case 1.—This individual was forty-two years old. Following a hernia operation, about four years before, one testicle began to diminish in size, probably due to interference with the blood supply. Two years later the patient noticed the other testicle was diminishing in size and that libido was not what it was formerly. He became weaker and was unable to work. He was sent to the hospital for study as the attending physician felt that he was suffering from Addison's disease. In the hospital it was noted that the testis and the penis were definitely small, the prostate was soft and flat. No spermatozoa were found on expressing the prostate and seminal vesicles. No change was noted in the hair distribution and he had to shave about as frequently as before. The blood pressure was low but no pigmentation in skin or mucous membrane was noticed. Salt deprivation tests did not cause any trouble and blood sodium chloride was normal. Urinary assay study showed a marked decrease in the excretion of androgens and estrogens. Androgens assayed 19 units in twenty-four hours; the estrogens, 24 international units in twenty-four hours. He had previously been given a series of cortin (adrenalcortical hormone) injections with no improvement.

Injections of testosterone propionate was started in 25 mg. doses three times a week. At the end of one week he reported was feeling much stronger and felt that he could try some light work. Libido was markedly increased and fairly satisfactory intercourse occurred. The penis was firmer and the glans redder. No change was noticed in the size of the testicles or prostate gland.

He was given nine injections over a period of three weeks of 25 mg. each. The hormone was stopped and the injections were continued with sterile water unbeknown to the patient. He continued for a little more than five weeks to feel strong and happy. He then began to tire easily and felt depressed. Libido had almost disappeared. He was started again on 10 mg. doses three times a week with only slight improvement. The doses were increased to 25 mg. with a return of the feeling of well-being that he had enjoyed before. One can feel sure that the psychological element was well ruled out.

Case 2.—A man aged twenty-four years, following mumps eight years before, developed an orchitis with a marked atrophy of both testes. The voice was high pitched. He shaved only about once a week, and the facial hair was soft and sparse. There was a moderate increase of fat over the pubis and lower abdomen and hips. He was married and had no children, and only rarely attempted coitus. Both testicles were pea size, penis and prostate small. No spermatozoa were present on prostatic and seminal vesicle massage. The urine androgen excretion was only 9 bird units a day and the estrogen was 15 international units.

Following four injections of 25 mg. of testosterone propionate he felt more vigorous and libido improved very markedly. Following fifteen injections of the same dose, the beard became coarser and denser, the pitch of the voice became definitely lower and he stated he was having satisfactory intercourse two to three times a week. Following the cessation of treatment all signs of improvement disappeared.

What are the indications for the use of this male hormone? These are not as yet entirely clear except in those instances where definite evidence of eunuchism or eunuchoidism is present. Here one can expect very definite and favorable temporary results.

It is particularly of value in the early age group who have, because of injury or disease, suffered a lack of testicular function with a resulting failure of development of the secondary sex characters. The lack of development in the secondary sex characters creates in the individual a marked sense of inferiority and may lead to serious psychopathic states. The diagnosis in this type is easy to make principally because of the absence of mature male secondary sex changes.

In the late castrate and eunuchoid individual in which the testicular injury was sustained after puberty had occurred, and in whom the secondary sex characters had already developed, the diagnosis is still not difficult as there is usually evidence of testicular atrophy. One must remember that in these cases often there is no change in the already existing sex characters. The beard may continue to grow, the voice will retain its normal pitch and even libido may be retained for some time. In such cases one cannot expect any somatic changes from the administration of the hormone. What reason, then, is there, if any, for the use of the hormone in such a case. Obviously none at all unless there is present marked weakness or definite psychoneurotic manifestations.

This type of case is very similar in its manifestations to that described as the male climacteric, that is, a change in the male, producing symptoms similar to that which occurs in the female in menopause: hot flashes, emotional disturbances, tachycardia, et cetera. As in the female it is supposedly due to a loss of function in the testicle due to a degenerative process. The resulting loss of testicular hormone which is pituitary inhibiting, permits an overproduction of the gonadotropic pituitary hormone which, supposedly, is responsible for the symptoms.

It is not easy to ascertain, clinically, whether a male climacteric is present. We have no guide like the loss of menstruation in the female to tell us that the gonads are no longer functioning. The characteristic symptom in females of hot flashes is only rarely present in the male. Loss of libido is not a reliable indication. The symptoms are primarly those that are associated with what we are accustomed to term as functional inadequacy or psychoneurosis. As yet the male climacteric as a definite clinical condition is not well established. Urinary sex hormone assays may help to identify this state more clearly.

As I have mentioned before, the urine in both sexes contains both male and female hormone-like substances and it is believed that a disturbance in this ratio is rather characteristic of certain conditions. Lacquer suggested because he found a relative increase of female urinary sex hormone in men with prostatic enlargement that by injecting male hormone there would tend to be established a more normal ratio which would help relieve the symptoms of prostatic hypertrophy. He reported fairly good results; other reports have been very conflicting. In general it is felt that in some cases the use of the male hormone will carry a patient over an acute period by increasing the tone of the bladder muscle, but that it will not produce a reduction in the size of the prostate or any change in the progress of the disease.

The question often arises whether this hormone should be given in those cases where there is a loss of libido not associated with testicular insufficiency? We know very little about libido and potency in the male except that frequently its loss and dimunition is purely a psychic manifestation. I have had no personal experience in using this hormone in this condition. The few reports available indicate that in the presence of a normal functioning gland, the hormone is not effective.

Cryptorchidism is often associated with hypodevelopment of the male sex organs, and in these cases the administration of testosterone propionate is very effective in causing a descent of the testis. It has been used in boys before the age of puberty, but for this purpose a more logical form of treatment would be the use of the anterior pituitary-like hormone to stimulate the activity of the testis and in that way cause a descent of the gland. However, in the individual past the age of puberty, with a failure of the development of the secondary sex characters and who also has undescended testis the male sex hormone should be given a trial.

Therapy

Before starting treatment, the physician must decide if there is any possibility of stimulating the function of the testis. To determine this is not easy. The size and firmness of testicles, the color and consistency of the penis and changes in the secondary sex characters are of great help. Complete absence of testicular function is definitely demonstrated by assay of the androgenic hormone in the urine. This method will also show marked hypofunction of the testis.

If the testis is capable of stimulation, the sex hormone should not be used; instead we should try the gonadotropic pituitary hormone or the urinary pituitary-like hormone. This hormone is capable in adequate doses of stimulating the testis to function. Response to this form of therapy is not prompt and the physician should be prepared to give at least two courses of injections lasting six to seven weeks each. The minimum amount to be injected should not be less than 500 rat units of anterior pituitary-like substance three times a week or 2 c.c. of the gonadotropic hormone of the pituitary gland given in the same manner.

At present the only satisfactory male sex hormone is testosterone propionate, a synthetic product marketed under several trade names. It is only recently that this hormone can be purchased at a price permitting adequate dosage. Early failures were due, I am sure, to the use of too small an amount. In an adult, doses under 10 mg. three times a week appear to be inadequate. I feel that in the beginning of treatment a dose of 25 mg. three times a week should be administered. After the desired effects are secured the dose can be cut in half.

Recently I received literature from a manufacturer who distributes ampules of bulls' testis hormone, each ampule containing, according to the statement, 2 capon units. Two capon units would be about equivalent to less than 0.01 mg. of testosterone propionate in effectiveness. About all that one can say about a dose of this size is that if it is injected into the capon every day for about six to eight weeks it will cause the comb to grow to the size of a normal rooster's comb. There is no oral preparation that is of any value. It seems fairly definitely established that percutaneous administration in the form of an ointment is about as effective as intramuscular injection if large amounts of hormone are used. This method of administration is still too new to warrant a definite statement as to the dosage, and adequate amounts would make his form of therapy very costly.

Are there any harmful effects from the use of the hormone? It has been tried in women for the relief of various ailments and several reports have shown that it has produced unusual hair growth that appeared to be permanent. It can also produce anginal pains in those individuals suffering from coronary sclerosis, probably from emotional disturbances. It is generally felt, in endocrine substitutional therapy that the administration of a hormone over long periods to an individual who has functioning glands that produce such a hormone would result in putting the gland to rest. Whether testosterone given to a patient with functioning testicles will injure the gland is not known at present. Experimentally it has been shown that small doses of 5 mg. and less will not, but whether 25 mg. given over long periods will cause an injury we do not know. Certainly the physician should select his patients carefully.

In conclusion, then, we can say that we now have available for substitutive therapy an effective male sex hormone capable of replacing in almost every respect the loss of function of the testicle. These effects are in no way permanent, because, following the cessation of treatment, there is a return, in a comparatively short time, of all the symptoms and signs that were present before the hormone was administered. Today there is only one clear indication for the use of this hormone and that is in those conditions where objectively, or by urinary hormone assay, there is a definite indication of the loss of testicular function. Its use has been advised in other conditions but as yet the evidence does not warrant such therapy.

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HYPOGLYCEMIC CEREBRAL DAMAGE IN DIABETIC PATIENTS*

J. A. LAYNE, M.D., and A. B. BAKER, M.D.
Minneapolis, Minnesota

WITHIN recent years a great deal of interest has been manifested on the subject of hypoglycemia and its effect upon the nervous system. The impetus for this interest has been due primarily to the widespread use of hypoglycemic shock as a therapeutic agent in the functional brain disturbances. As a result of recent investigations both on human and animal brain tissue (Terplan,[18] Malamud and Grosh,[15] de Morsier and Mozer,[9] Kobler,[13] Schmid,[17] Accornero,[1] Baker,[2,3] Baker and Lufkin[4]), it appears fairly well established that hypoglycemia, regardless of the cause and often unrelated to its severity, produces in many individuals fairly severe and often permanent brain tissue damage. This damage consists of cerebral petechiæ, areas of demyelinization and cavity formation, and diffuse and focal glial proliferation. Nerve cell injury does occur but is not always the most conspicuous finding. The implications of these observations to the field of medicine, especially in cases of insulin overdosage in diabetics, have been, for the most part, neglected. Ever since the introduction of insulin in the treatment of diabetes, the internist has been confronted with the occasional occurrence of mild and severe insulin reactions. These have been considered rather lightly since most reactions respond fairly promptly to proper treatment with glucose administered orally or intravenously. However, in view of the present knowledge concerning the effects of hypoglycemia upon the brain, one is forced to admit that insulin reactions may not be entirely innocuous. A review of the literature and a study of our own cases has emphasized the fact that in some individuals overdosage of insulin may produce definite damage to the cerebral tissues.

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*From the Divisions of Internal Medicine and Nervous and Mental Diseases, University of Minnesota.

The dangers of insulin reactions were realized as early as 1921 when Joslin[11] cited two fatalities in diabetics. Since that time Joslin[12] has published the records of five deaths from insulin overdosage; none of these patients were, however, under Joslin's care. In three, a diagnosis of diabetic coma was made and insulin given to a patient already in hypoglycemia, while in a fourth case, death resulted in spite of glucose therapy. Many other fatalities have been reported in the literature (Campbell and Macleod,[7] Pemberton,[13] Heimann-Trosien and Hirsch-Kauffmann,[10] Dahl,[8] Wohlwill,[19] Terplan,[18] Bodechtel,[5] Bowen and Beck,[6] and Lindsay,[14] et al). Campbell and Macleod reported two cases; one patient was an alcoholic who failed to respond after taking an overdose of insulin, while the other succumbed after increasing the insulin dosage because of a gastro-intestinal disturbance. Pemberton's patient suffered from both tuberculosis and diabetes. On the regular regime the patient suddenly went into hypoglycemia and failed to recover. Both of Wohlwill's patients received overdosage of insulin. The first patient on his regular dosage developed hypoglycemia and was given an additional 135 units of insulin. She failed to respond in spite of subsequent glucose therapy. The second patient expired after being given an extra 100 units of insulin because of a breast abscess. Terplan's patient also received an overdose of insulin and developed a hypoglycemia which manifested itself in generalized convulsions. In spite of therapy he failed to respond and died in three days. Both of Bowen and Beck's cases were diabetics who were given insulin while already in hypoglycemia. Lindsay's case was a fifty year old diabetic who died after eight days of coma. He also failed to respond in spite of prompt institution of the proper therapy.

Although the list of reported hypoglycemic fatalities in diabetics is not very large, it seems fairly safe to assume that this small number of cases is due probably to the failure to study and record such accidents. Even more important, however, than these fatal cases are those that show slow recovery or recovery with permanent functional impairment. These cases tend to demonstrate the borderline in the reversibility of the cerebral changes. From the recent studies in hypoglycemia, there can be no doubt that single severe or repeated hypoglycemic shocks may produce a depression of cerebral function and often some irreversible changes of the brain tissues. The degree of these changes determines whether the patient experiences a slow recovery, recovery with permanent functional involvement, or failure of recovery and death. It is with the purpose of reporting such cases and of emphasizing the dangers of hypoglycemia in diabetics that this report is made.

Case Reports

Case 1.—J. N. (No. 683244), a forty-nine-year-old laborer had had diabetes mellitus for fourteen years. For the past several years he had taken fifteen units of regular insulin twice daily. During this period, he had experienced numerous hypoglycemic reactions. He was, in addition, a chronic alcoholic, and some of his hypoglycemic reactions were possibly mistaken for acute alcoholism. On the afternoon of the day of admission, he was found in an unconscious state by his relatives. His condition was mistakenly attributed to acidosis, an additional 25 units of regular insulin were given, and he was admitted to the University Hospital five hours later. His blood sugar at this time was less than 14 mgm. per cent. Glucose, in large amounts, was administered intravenously and his blood sugar thereafter maintained above 170 mgm. per cent. 3,000 c.c. of para-oral fluids were given daily.

His temperature was 97° F. (rectal) on admission, but in a few hours rose to 105° F., and remained thereafter between 103° F. and 105° F. The patient lived for sixty-two hours after admission to the hospital; he did not regain consciousness before he died.

The autopsy studies were essentially negative except for the brain. Microscopic study of the brain tissue revealed scattered areas of early myelin alteration. In some regions a beginning fragmentation of the myelin tissue was apparent. A few scattered patechiæ could be found. Only an occasional glial nodule was observed.

Case 2.—A. N. (No. 674133), a fifty-three-year-old laborer, had had diabetes mellitus for four years. He was first admitted to the University Hospital for an amputation of the right great toe because of arteriosclerotic gangrene. One hundred and thirty units of regular insulin daily were required at this time for the control of his diabetes. The wound healed poorly, and a low thigh amputation was advised, but was refused by the patient, who then returned to his home. Due partly to the persistence of infection in the arteriosclerotic extremity, his diabetes was poorly controlled at home, and he experienced several severe hypoglycemic reactions. Three weeks after his discharge, he was readmitted to the hospital in a severe hypoglycemic state. The blood sugar level was less than 15 mgm. per cent, and his temperature was 101° F. (rectal). Intravenous glucose was administered in large amounts, and two hours after admission his blood sugar was 189 mgm. per cent. The patient did not regain consciousness; he became progressively worse, and expired five hours after entrance to the hospital.

Autopsy studies revealed no somatic changes except in the brain. There was a large area of encephalomalacia situated in the right frontoparietal region, as well as smaller cavitations in the occipital poles. Microscopic studies showed a diffuse and patchy demyelinization. Glial proliferation both of a diffuse and nodular nature was also present. Small petechiæ could be found in most sections.

Case 3.—A. C. (No. 38-822), a thirty-nine-year-old man, had been a known diabetic patient for twenty years. He had had several severe insulin reactions, during one of which he had had several convulsions. A year prior to his death he attempted to change to protamine insulin, but suffered a severe reaction. He was subsequently controlled with regular insulin. On the evening of his death he collapsed in the bathroom shortly after receiving his evening insulin. He was found by his mother in this state, and was given considerable amounts of orange juice, which he swallowed. A physician was called, but the patient was dead at the time of his arrival.

Significant autopsy changes were found only in the brain. Grossly, petechiæ were visible in the subependymal regions of the lateral ventricles. The histological changes were relatively mild, and consisted primarily of a diffuse type of glial proliferation. There was also observed a tremendous distention of the perivascular spaces with a mild vacuolization of the white substance to form small cavities. The nerve cells were generally shrunken.

Case 4.—R. S. (No. 648507), a sixty-two-year-old farmer, was admitted to the University Hospital with symptoms referable to a chronic cholecystitis, cholelithiasis and severe diabetes. He required an average of 184 units of insulin daily during the sixteen months he was under observation. During this time he experienced several severe insulin reactions. Prior to his last admission, while at his home, he developed an upper respiratory infection, followed by acidosis. A total of more than 500 units of insulin (regular) were given during the next eighteen hours. By this time sugar was no longer present in his urine, but he was still comatose and was perspiring freely. Insulin was discontinued and, following the administration of sweetened fruit juices, he gradually recovered consciousness. Although no determinations of his blood sugar were made during this period, it appears not unlikely that he passed from diabetic acidosis to a hypoglycemic state before recovering consciousness. When he was brought to the University Hospital a day later, his condition appeared good. On the following day, however, a mild spasticity appeared on the right side. He became disoriented and irrational, and had several convulsive seizures involving the right side of his body. His blood sugar was maintained at a normal level during this period, and acidosis did not develop. His condition gradually became weaker, he failed to respond, and died without regaining consciousness.

At postmortem there was found a chronic pancreatitis, fatty changes in the liver, and some edema of the lungs. Gross examination of the brain revealed a multilocular cavity in the left inferior parietal lobule and scattered petechiæ throughout the white substance of both hemispheres. Microscopic studies revealed areas of encephalomalacia with cyst formations, marked gliosis, and numerous scattered petechiæ. The glial proliferation in some areas was so extensive that it had replaced large areas of brain tissue.

Case 5.—J. M., an eight-year-old white boy, developed symptoms of diabetes one year prior to his first hospital admission. He was well regulated with diet and 5 units of insulin (regular) three times daily. He was then followed in the Out-Patient Department of the Minneapolis General Hospital, where nothing abnormal was noted insofar as concerned his mental condition.

One year later, he was admitted to the hospital in a critical condition, unconscious, and having violent tetanic convulsions, Two days prior to this the child had had a mild cold, and his insulin (regular) increased to 65 units daily. On the day of admission he felt well, went to school and played as usual. Ten minutes after receiving 20 units of insulin (regular) at

6:00 p. m., he developed convulsions. Orange juice and sugar by mouth were without effect; he vomited violently and was immediately brought to the hospital.

On admission the child was in coma, and was having violent tetanic spasms. The eyes moved from side to side. Respirations were of the Cheyne-Stokes type. Spasm of the laryngeal muscles was present with extreme cyanosis. He was given large amounts of glucose intravenously, as well as calcium chloride, chloral hydrate and sodium amytal, all of which proved of no avail in stopping the convulsions. It was not until several hours later that his convulsions were finally controlled with deep ether anesthesia.

Blood taken at the time of his admission revealed the sugar to be below 30 mgm. per cent, the carbon dioxide combining power 50 volumes per cent, blood calcium 6.8 mgm. per cent.

Large amounts of glucose were given intravenously, and the patient slowly regained consciousness. It was not until a week had elapsed, however, that the patient began to respond to questioning, and even then he was unable to speak coherently. The child was followed in the hospital for a period of six months, during which time his diabetes was well controlled, but his mental condition did not return to normal. The patient was unable to cope with even simple situations, such as dressing himself. Perseveration—the repetition of words—was frequently noted. He would often fail to recognize individuals whom he had known since childhood. His neuropsychiatric evaluation was that of marked mental retardation. Repeated examinations of his spinal fluid were normal, as was roentgen examination of the skull. Institutional care was recommended but refused by the parents. He was discharged from the hospital on a regime of 35 units of insulin (regular) daily. Only slight improvement had occurred in his mental condition at the time of his last examination.

Case 6.—H. E. (No. 643612), a fifteen-year-old white school girl, had been diabetic for about eleven years, requiring 15 units of insulin (regular) three times daily. Because of frequent mild insulin reactions, she was admitted to the Pediatric Service of the University Hospital for regulation. Her insulin was changed to 45 units of protamine given once daily at 8:00 p. m. Shortly after admission she had a mild insulin reaction, but responded at once to the oral administration of sweetened orange juice. Two days later she was difficult to awaken, complained of nausea and was unable to void. She was fed her breakfast, but later vomited all the food taken. Following this, she became semicomatose, and developed peculiar jerking movements of the right side of her face and body. She was given glucose intravenously, but did not respond well. The blood sugar that evening was 38.5 mgm. per cent. Glucose was administered steadily, but the patient remained in a semi-comatose state throughout the following day. Her temperature rose to 105.5° F., and her pulse to 176 per minute. Spinal fluid was found to be under pressure of 18 mm. of mercury. On neurological examination the fundi were normal, the deep reflexes were slightly increased on the right, and the Babinski sign was positive on the right. The patient gradually improved, although an aphasia and right-sided paresis persisted. A week later her temperature and pulse were normal; she would respond when spoken to, but she was still disoriented, and failed to recognize familiar objects. Her diabetes remained difficult to control, requiring from 40 to 45 units of insulin (regular) daily. At the time of her discharge from the hospital there still remained a definite aphasia and a right-sided paresis. Following her discharge, the child had occasional peculiar attacks characterized by falling to the floor, tonic spasms, followed by clonic contractions of all the extremities. These appeared without warning and would last for several minutes. She has also had peculiar crying spells, and has complained of mild headaches with visual disturbances.

At the time of her last examination, she had shown a definite improvement in her speech, and was able to carry on the simplest types of conversation. There was a slight weakness and ataxia in the right upper extremity, and a bilateral loss of position sense.

Case 7.—H. M. E. (No. 612595), a twenty-one-year-old woman, had had diabetes mellitus since the age of four years. From the beginning she had been difficult to control, and insulin reactions were not uncommon. About two years prior to her last admission she was requiring in excess of 100 units of insulin (regular) daily.

One year prior to her last admission to the hospital, the patient's breakfast and insulin were delayed until 11:00 a. m. After receiving her insulin and eating, she became drowsy and remained in a semicomatose state for a week. She could be aroused but immediately returned to sleep. She took little food, and her insulin (given by her mother) was reduced. During all this time, she had no sugar in her urine. By the end of the week the patient was somewhat less drowsy and was eating more regularly. It was not until the end of the second week, however, that she resumed her normal diet and had regained her usual activity. Although this episode took place at the patient's home, without attendance of physician or benefit of blood sugar determinations, it appears most probable that she had experienced a mild attack of prolonged hypoglycemia. No objective neurological signs could be detected following this episode, but a definite change in her personality occurred.

The patient has been seen periodically in the Out-Patient Clinic. She has continued to have mild hypoglycemic reactions which have been readily controlled with orange juice. Throughout this time her personality disturbance has continued, the patient manifesting frequent attacks of unmotivated laughing, with a definite inability to concentrate. The neurologic examination has continued to be negative.

Discussion

This brief summary of our cases of hypoglycemia in diabetics readily demonstrates the dangers of such reactions. There can be no doubt that definite cerebral damage occurred in all of these cases. This has been verified by the autopsy studies on the four fatal cases, and by the clinical observations on those that recovered. The potential dangers of hypoglycemia are accentuated by the fact that with our present knowledge one is unable to predict accurately when such a reaction will occur, since it is well known that the individual response to insulin may vary from person to person, and even within the same individual. It must also be kept in mind that with the increasing use of protamine insulin the usual prodromata of incipient hypoglycemia are frequently altered, and therefore not recognized by the patient or the family. Even more indefinite is our knowledge concerning which individuals can tolerate a hypoglycemic condition, since some will recover readily from fairly severe reactions, while others show definite cerebral damage with only mild attacks. One fact stands out from our studies, and that is, that any associated chronic disease that might affect brain tissue, such as alcoholism, arteriosclerosis, or prolonged chronic infection, will tend to make diabetics, when they develop hypoglycemia, much more susceptible to irreversible brain tissue changes. In such individuals one must be extremely cautious to avoid even the slightest degree of hypoglycemia and to treat these reactions, if they occur, immediately and adequately.

However, the dangers of hypoglycemia are equally or even of more significance in the younger age group, where frequently death does not ensue, but the reaction produces permanent brain damage with a resulting slow recovery and persisting disabilities in the neurological and mental spheres. Many of these individuals slip into hypoglycemia with little or no alteration in their insulin dosage, and are frequently misdiagnosed as diabetic acidosis and given more insulin. This additional insulin may be just sufficient to produce irreversible changes in an already hypoglycemic brain. In view of the distinct possibility of cerebral damage one must caution against a too hasty administration of insulin to a comatose diabetic. It is imperative, moreover, that the physician be extremely thorough in his directions to the diabetic patient concerning the use of insulin. And not only should these individuals be instructed in the possible dangers of hypoglycemia, but their families and attendants should be educated to recognize the prodromata of hypoglycemia, and to appreciate the absolute necessity of employing the proper precautions to prevent the development of a severe reaction.

Once the brain tissue has been damaged by hypoglycemia the return of the blood sugar to a normal or an elevated level appears to have little effect upon the course of the illness. Coma following hypoglycemia may persist for days and eventuate fatally in spite of a high blood sugar level. It is important, nevertheless, to maintain a normal or slightly elevated blood sugar level during this period since a great deal of the cerebral changes may be reversible and definite improvement may occur.

Conclusions

1. The histories of seven diabetics believed to have had hypoglycemic cerebral damage are reviewed. Four of these cases terminated fatally, while the other three recovered, but presented persisting signs of brain damage.

2. Because of the distinct possibility of cerebral damage in any case of hypoglycemia one must be very careful in the directions given patients who are to use insulin. One must also be doubly cautious in the administration of insulin to a comatose diabetic until the possibility of an existing hypoglycemia has been eliminated.

The authors wish to express their appreciation to the Department of Pediatrics for allowing them to include Cases 5 and 6 in this report.

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RADIUM TREATMENT OF CERTAIN RARE BENIGN CONDITIONS*

ROBERT E. FRICKE, M.D.
Rochester, Minnesota

RADIUM, with roentgen therapy and surgery, has its major importance and usefulness in combating cancer. In the last few weeks Dr. C. C. Little, head of the American Society for the Control of Cancer, has published a small book which as yet I have not seen. In the lay press, however, the author of this book is given as authority for the statement that in this country in the last five years, 30,000 patients with cancer have been cured by surgery, radium and roentgen therapy, and that these three methods of attack are the only scientific therapeutic methods known.

In recent years there has also been an interesting development in the treatment of benign conditions with radium. Many diverse nonmalignant diseases have been found to respond favorably to careful treatment with the powerful element.

Instead of describing the more common diseases treated with radium, it may be of interest to consider three quite rare conditions for the inherent interest in the disease itself as well as for the results attained. As this paper is general in character, the technical details of treatment have been omitted.

One of these rare conditions is congenital and hence is treated in infancy; the second condition occurs at any age, usually following a major surgical operation; the third disease is encountered in elderly men.

The first disorder to be considered is cystic hygroma of the neck, an exceedingly rare benign tumor with serious potentialities. Although first described by Redenbacher in 1828, case reports have been scanty. In 1913, Dowd collected ninety-one cases from the world literature. In 1934, Vaughn added sixty-four additional cases reported since 1913, and MacGuire, in 1935, added eight others. Hence approximately to date 163 cases have been found, only nineteen of which were in adults. Fleming sums up the knowledge to date very expertly and reports two additional cases in adults.

Briefly, cystic hygroma is a congenital condition usually first noted in the first four years of life. The symptoms are those of a simple non-inflammatory tumor; pressure may produce dyspnea and dysphagia. It is a thin-walled cystic, movable tumor, situated ordinarily in the lower half of the neck, containing lymph and lined by endothelium. Usually the tumor is lobulated, being made up of several separate cysts. It may, on occasion, extend to the mediastinum and into the axilla. It is usually bluish in color and translucent. These tumors are believed to arise from lymph sacs formed during the embryologic development of the lymphatic system. Diagnosis is not difficult if one keeps in mind the aforementioned characteristics, especially when aspiration of the tumor discloses lymph. Other conditions to be differentiated are branchial cysts, lipomas, thyroglossal cysts, deep-seated hemangiomas, aneurysms and infected lymph nodes.

Before the days of irradiation, treatment had been mainly surgical, although this attack was at times impossible and the results were often unsatisfactory. The tumor, in many cases, proved too extensive to resect; in others, isolated lobules were missed and recurrences appeared. From January 1, 1910, to December 31, 1937, inclusive, thirty-four hygromas of the neck have been treated at The Mayo Clinic, twenty by radium therapy, three by roentgen therapy and eleven by other methods, mainly surgical. Since the advent of radium therapy at The Mayo Clinic in 1915, treatment has been mainly with this agent, and practically entirely so since 1918. New, of The Mayo Clinic, was probably the first to report the use of radium in this disease. In 1929, Figi, of The Mayo Clinic, reported thirteen cases; twelve had been treated with radium and one excised. Of the thirteen patients, seven died between courses of treatment from acute inflammation in the tumor, always a dangerous complication. Three patients were entirely cured, one greatly improved and two considerably improved. Therapy consisted of the application of radium at a distance over the tumor; one to nine applications were given three or four months apart, four being the average number of treatments.

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*From the Section on Therapeutic Radiology, The Mayo Clinic, Rochester, Minnesota. Read before the annual meeting of the American Therapeutic Society, St. Louis, Missouri, May 12 and 13, 1939.

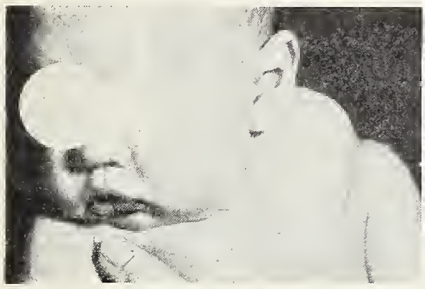

Fig. 1. Cystic hygroma on left side of neck of child aged six weeks. Picture taken in November, 1934, before treatment.

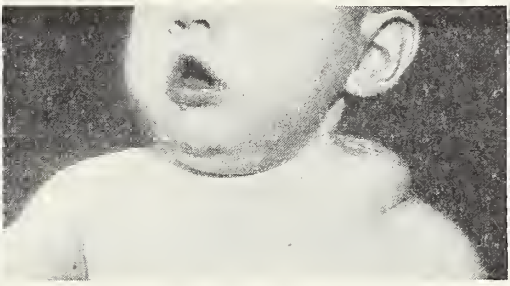

Fig. 2. Cystic hygroma. Same subject as in Figure 1. Picture taken in February, 1935, after the first treatment with radium.

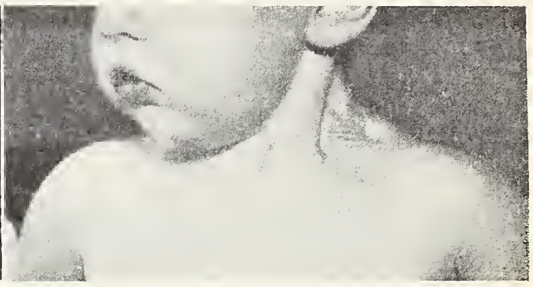

Fig. 3. Cystic hygroma. Same subject as in Figures 1 and 2. Picture taken in August, 1936, after three applications of radium.

I now wish to report an additional nine cases treated with radium at The Mayo Clinic from January 1, 1929, to January 1, 1939. The youngest patient was six weeks old at admission; the oldest child was four and a half years old; one patient was an adult, aged forty years. This adult had had three surgical excisions during the past twenty years, elsewhere, with recurrences. Of this group of nine patients, one died of an acute infectious process in the tumor during a treatment. The adult patient obtained only slight improvement. Among the infants, five were entirely cured and two showed marked benefit. Figures 1, 2 and 3 depict one typical cured patient, a child aged six weeks on admission, with a large cystic hygroma of the lower left side of the neck. Disappearance of the tumor was achieved by three treatments with radium, three months apart. The photographs portray the condition before treatment and after the first treatment and the final result. In all cases, treatment consisted of radium applied at a distance, with a mild dosage below a skin erythema; in one case interstitial radium was also employed.

Acute parotitis, following a major surgical operation, has been recognized as a serious postoperative complication since 1878. The condition is rare; one survey showed the incidence to be about one in 2,275 general operations (Beckman). However, it is a very serious disease. Several hypotheses to account for the infection have been advanced; the one supported by animal experimentation is that infection spreads into the gland by direct passage of bacteria from the mouth along Stensen's duct, in individuals debilitated by a serious operation and when secretions are diminished by the administration of opiates. If unchecked, the infection spreads rapidly and fluctuation becomes evident. The condition may spread and become bilateral; incision and drainage may be required, or the abscess may rupture spontaneously, with a grave prognosis. Parotitis alone is a serious postoperative complication, but it is often accompanied by other serious terminal disorders, such as peritonitis, pneumonia and intestinal obstruction.

In 1935, Green reviewed the literature, and found the mortality of acute parotitis in the combined American statistics to be 58 per cent. Rankin and Palmer, of The Mayo Clinic, reported fifty-eight cases not treated with radium with a mortality of 39 per cent, and twenty cases treated with radium with a mortality of 20 per cent. In 1936 a study was published of 184 cases treated with radium at The Mayo Clinic from January 1, 1929, to December 31, 1934, inclusive, with a mortality of 19.6 per cent. Analysis of these cases corroborated the impressions of Rankin and Palmer: (1) Radium, when applied immediately to the infected region, tends to abort suppuration and reduce mortality.

(2) If surgical incision becomes necessary, the prognosis is more grave. (3) The greater the extent of the infection, for example bilateral parotitis, the higher the mortality. (4) The more serious the operation preceding the infection, the higher is the mortality.

Our treatment with radium in the last two years has been even more successful than in the earlier period, owing, I believe, to the more prompt recognition of the disease and the earlier institution of treatment. During 1937 we treated forty cases, with death in five instances, a mortality of 12.5 per cent. During 1938 there were twenty-six cases with two deaths, an 8 per cent mortality. Lessened mortality in any year may also be due to variation in virulence of the bacteria involved.

The third disease to be discussed is Peyronie's disease, first described by this physician to Louis XV in 1743. It is found in the literature under various names, as fibrous cavernositis, fibrous sclerosis, primary indurative cavernositis and plastic induration of the penis. The cause is still unknown, although syphilis, gonorrhea, trauma, gout and arthritis have all been suggested as causative factors. The findings are a plaque, nodule or cord, solitary or multiple, involving the sheaths of the corpora cavernosa and the septum, usually in the dorsum and midline of the penis. The urethra and corpus spongiosum are usually unaffected. The lesion is not tender and the skin is movable over it. It occurs in middle-aged and elderly men and causes deformity on erection or pain on erection, often rendering sexual intercourse difficult or impossible.

Peyronie's disease is comparatively rare, but Polkey found 549 cases reported in the literature by 1928. Treatment has been by means of surical excision, diathermy, roentgen therapy, iodides, fibrolysin and radium. Polkey found very poor results from all methods of treatment; in 419 cases in the world literature cures were obtained in seventy-six cases, or 18 per cent, and in addition 9 per cent were improved. During 1935, 1936 and 1937, we have been treating these cases with radium and have reported the results; this report is still in press. Thirty-four patients were treated during this period and a rigid, nonpartisan analysis of results showed cure in 19.3 per cent and improvement in an additional 32.3 per cent, thus obtaining better results with radium alone than with all methods combined. Two observations of value were an outgrowth of this survey: patients that had had two or three treatments a few months apart obtained far better results than had come from only one application; in other words, undertreatment had been a cause of failure. Secondly, the duration of the disease affects the prognosis. Our cured patients had had symptoms on the average for six months only; improvement was secured in cases in which the symptoms had been present for an average of twenty-one months; no effect was obtained when the symptoms had endured for an average of twenty-nine months before treatment.

An additional survey of last year's experience revealed that in 1938 we treated twenty new patients with radium, and twenty returned following previous treatments. Of this last group, one was cured, two were unimproved and seventeen showed improvement and returned for further treatment.

Peyronie's disease is not an important one and does not ordinarily progress beyond a certain stage of discomfort; however, it leads to much mental distress and neurasthenic states.

Comment

Three diverse disease entities have been dealt with: cystic hygroma of the neck, acute postoperative parotitis, and Peyronie's disease. The first is a benign congenital tumor, the second an acute infectious process, and the third a chronic inflammatory condition. Different age groups are involved. The only similarity in these three disorders consists in their rarity and in the fact that they are nonmalignant and that cure or improvement has occurred with radium therapy.

One pertinent question is whether other methods of treatment of these rare conditions might also be effective. Surgical intervention has not proved of much assistance. Roentgen treatment would very probably serve as well as radium in cystic hygromas and should be also employed in more extensive cases in which the mediastinum and axilla are involved. However, these cysts occur in infants, and radium can be more easily and effectively applied. The blocks bearing the radium tubes can be easily taped over the affected region and will usually stay in proper position during the treatment. Under an x-ray tube the infants tend to change their position and are difficult to restrain, so that accuracy of treatment is difficult.

Similarly, in acute parotitis, roentgen-ray therapy will serve if radium is not available. Again it is a question of ease and accuracy of treatment. The patients are seriously ill, not ambulatory, often in oxygen tents or may even be practically comatose. Radium can be brought to the bedside and accurately applied. We maintain an emergency service just for these cases.

In fibrous plaques, radium has been found most efficient when one employs highly filtered rays, screened with lead, shorter than those generated by x-ray tubes at ordinary voltages. Some cases have been helped by radium where previous roentgen therapy has failed.

Finally, it is interesting to speculate on the rationale of radium treatment of these rare benign conditions. The effect of the gamma irradiation of radium on malignant conditions is better understood; we know the usual lethal effects on rapidly growing cancer cells and even the relative sensitivity of different normal body tissues. Even different types of malignant growths have been studied in their differential response, so that it is often possible to diagnose the type of the malignant growth by a study of its response to irradiation.

Treatment of benign conditions has been a later study, and is not so far advanced. Cystic hygroma is a tumor containing lymph elaborated by the endothelial lining of the component cysts; the radium rays apparently destroy this endothelial lining so that further lymph is not produced.

Acute parotitis is an acute infectious process; treated at its inception, suppuration and abscess formation are aborted and resolution occurs. As Desjardins has suggested, the protecting wall of leukocytes, which forms around any acute infection, is broken up and destroyed by the rays; presumably, protective antibodies are liberated and the bacteria are killed.

We treat fibrous plaques as we do keloids. The German physician, Dreyer, in 1911, was among the first to develop this technic. The method is logical, as under the microscope a fibrous plaque is seen to be composed of elastic and scar-like tissue resembling a keloid, and we know that radium rays soften and absorb young connective tissue. Older keloids show deposits of cartilage and bone, as do long-standing fibrous plaques; these tissues are resistant to irradiation, and this doubtless accounts for our lack of success in treating long-standing fibrous plaques.

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Patch Test for Children

One hundred and sixty-nine children at Sea View Hospital, Staten Island, New York, were given the Mantoux intracutaneous tuberculin test together with the tuberculin patch test and it was found that only one failed to react to the patch test who reacted positively to the Mantoux test. One hundred and eighteen additional children were tested in the pediatrics service at Mount Sinai Hospital in New York and the Mantoux test revealed no case which had not been discovered by the patch test. The value of the patch test for young children appears to be firmly established and it has the additional advantages that it never provokes a general reaction and never frightens either the children or the parents.—VOLLMER, H, and GOLDBERGER, E. W., Amer. Jour. Diseases of Children, Sept., 1938.

CASE REPORT

REGIONAL ILEITIS*

F. C. SCHULDT, M.D., F.A.C.S.
Saint Paul, Minnesota

Mrs. L., aged fifty-two, first came for advice on May 26, 1938. She complained that she had had considerable pain in her abdomen for four days. She had vomited once. The pain was worse after taking food, especially cold foods. All foods, however, caused distress. She recalled that she had noticed this pain for six weeks. Now she was suffering a constant pain. Alkalies gave no relief but instead caused her to vomit.

Twelve days later it was evident that she was vomiting more frequently. The pain now was located in the lower right quadrant. She had six watery stools on this day. A non-residue diet, with salol and bismuth, corrected the loose stool.

Gall bladder had been removed eight years ago and the appendix two years ago. There also had been a pelvic operation for retroflexion.

On June 13, 1938, the patient was admitted to the hospital. A barium enema at this time revealed a normal colon. Her temperature varied from 98.6 to 99.4.

A flat plate of the abdomen revealed normal kidneys, and no evidence of urinary stones. Some gas-filled loops of small intestine were visible in the upper abdomen; also evidence of free fluid in the abdomen. No mass could be felt.

Leukocytes numbered 17,000; polymorphonuclears 31 per cent; eosinophiles 41; small lymphocytes 17; large lymphocytes 9.

Stool examination showed no ameba, ova, pus nor blood.

Ewald test meal showed: free HCl 0; combined HCl 9; organic acids 4; lactic acid 0; occult blood 0; bile, trace; Boas Oppler 0.

Vomiting and pain in the right abdomen were pronounced.

Due to the x-ray evidence of gas in the small intestinal loops a diagnosis was made of post-operative adhesions following the appendectomy. Operation was advised. On June 22, 1938, under spinal anesthesia the abdomen was opened. A large quantity of free fluid was present in the peritoneal cavity. Three feet of the terminal ileum were found to be thickened, indurated and swollen—a hyperplastic type of ileitis. The wall of the bowel seemed to be three-eighths of an inch or more in thickness. Peristaltic waves were seen to pass along the involved ileum. About eight feet of the ileum were examined and even here, eight feet away from the cecum, the ileum was injected, but its lumen was good. At a point about five feet from the cecum an anastomosis was made with the transverse colon, side to side. The post-operative course was normal. She sat up on the sixth day. Seven days after the operation she began to have loose stools, due to the short circuiting. She left the hospital feeling quite well.

There was no more vomiting and the pain was less but loose stools continued as we should expect. Fourteen days postoperatively the eosinophile count was 12 per cent, white blood cells 10,000, hemoglobin 87.

The patient was kept on a low residue diet for seven weeks. During this time the stool remained loose—a food diarrhea. After a residue food diet was given the stool became formed. Six weeks postoperatively there was no vomiting and only occasionally some pain. She felt stronger and ate well. Nine weeks after the operation there were no eosinophiles present. Seven months after the operation there was no vomiting. A mild attack of pain would come on twice a week. Two times in a month, the stool was watery but otherwise soft and formed. Her weight increased constantly. The only medication now was dilute hydrochloric acid for her anacidity. On May 10, 1939, ten and one-half months after the operation, she reported that she felt well, was still gaining weight, and there was no vomiting. The stool was soft and formed, and occasionally loose. A roentgenogram of the small bowel made at this time showed that all of the ileum was functioning, the barium meal filling the cecum and ascending colon and the ileum lumen being normal. By September 21, 1939, the patient had gained 14 pounds since the operation. There were loose stools at times, but no vomiting, and very little pain.

Discussion

The only preoperative facts that we were at all sure of were: (1) some gas in the small intestine; (2) much free fluid in the abdomen; (3) eosinophilia; (4) a vomiting suggestive of low-grade small bowel obstruction; (5) an infectious process causing a mild fever and leukocytosis. X-ray examination findings following a barium meal were indefinite.

By way of differential diagnosis it was necessary to eliminate the presence of: (1) ureteral stone; (2) infected retroperitoneal lymph glands; (3) adhesions causing a kink following the appendectomy; (4) intestinal parasites.

On reëxamination of the roentgenogram of the small intestine after the surgical diagnosis of ileitis, it became increasingly clear that we had the finding on the film. Three loops of the ileum showed a distinctly narrowed lumen.

The terminal three feet of the ileum which were hyperplastic had a narrowed lumen so that when the short circuiting operation was done the food column went the route of least resistance into the transverse colon. By doing the anastomosis we diverted the liquid content of the ileum from that portion of the bowel which has absorptive qualities for reducing the liquid stool to a formed state. The watery stool was not an enteritis, but rather a food diarrhea, the liquid ileum content missing a portion of the absorbing chamber. The fact that she now has a formed stool is explained by our x-ray finding that the ileum is again functioning.

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*Read before the Ramsey County Medical Society, Saint Paul, Minn., September 25, 1939.

We felt that there was considerable significance in the high eosinophile count. In no place in the literature has it been mentioned. When in a disease process there is a 41 per cent eosinophilia present and fourteen days following a short-circuiting operation the eosinophiles drop to 12 per cent and one year later to normal it does seem as if one should include the eosinophilia in doubtful cases of pathologic lesions of the intestine.

Anemia was not present and this with a normal cecum on x-ray ruled out malignancy of the cecum and ascending colon.

Weber[8] reports: "Tuberculous enteritis has so much in common morphologically with the nontuberculous form with which we are primarily concerned here that the two are not always readily distinguished from each other even at gross pathologic examination. A search should be made for extra-enteral foci of tuberculosis." In the hyperplastic type the feel of the ileum is of a smooth, even doughy consistence, with no nodules at any place and no abrupt change from the pathologic to the normal, but rather a graded change. Up to 1932 these cases were considered to be tuberculous or fell into a nondescript class. Then Crohn[4] and his associates described this regional inflammatory disease of the intestine and named it regional ileitis.

Bargen[1] reëmphasized the lack of evidence for incriminating any particular bacterium as a causative agent of this condition. Obstruction and massive hemorrhages are also symptoms which are alarming. Perforation into a neighboring viscus occurs sufficiently frequently to be of considerable concern.

In those cases where there has been much loss of weight, Dixon[5] prefers to do a short-circuiting operation, ileum to transverse colon, and later a resection of the involved bowel together with generous removal of mesentery. Dixon states that occasionally permanent relief may be obtained by a short-circuiting operation but prefers the removal of the diseased bowel.

Clark[2] recites various symptoms which are found in the study of a group of cases. These symptoms are: a palpable mass, diarrhea, fever, obstruction, abdominal cramps, anemia, pain, blood in the stool, fecal fistula, arthritis and tarry stools.

In a study of thirteen cases of granuloma of the bowel, Pumphrey[6] reports on the bacterial causative agent and comes to the conclusion that these lesions may be caused by many different agents. The true etiology is unknown.

Crohn[4] et al outlined the physical findings as: (1) a mass in the right iliac region; (2) evidences of fistula formation; (3) emaciation and anemia; (4) the scar of a previous appendectomy; (5) evidence of intestinal obstruction.

The same authors stress the differential diagnosis of regional ileitis from ulcerative colitis of the proximal colon, fibroplastic appendicitis, lymphosarcoma, intestinal or mesenteric tuberculosis, Hodgkin's disease and carcinoma of the cecum. In this, the earliest pronouncement of ileitis, Crohn emphasizes that the disease involves only the terminal eight to twelve inches of the ileum and definitely not the colon, while in later articles the colon and jejunum also had been found to be involved.

In the original article Crohn et al recognizes the medical treatment as futile. Surgical resection of the diseased segment with the ileocecal valve and cecum is the treatment used by Crohn. He does not advise the short-circuiting operation. In our case an ileocolostomy has corrected nearly all of the clinical symptoms and pathologically according to the roentgenogram. To remove five or more feet of ileum did not seem to be good judgment. Crohn mentioned a very small amount of fluid being present in the abdomen whereas in our case there was considerable free fluid present.

In twenty-one cases studied, Coffey found three cases in which tuberculosis could be demonstrated and in these the roentgenogram of the chest also revealed active tuberculosis, and tubercle bacilli were present in the sputum. This author reports on the microscopic findings as being those of an exudative, proliferative, sub-acute or chronic inflammation, which at times suggest a Hodgkin's type.

In their summary of the literature, Ravdin and Johnston[7] collected their compilations from 289 different articles and have in a compact form presented this controversial subject. They give due credit to Crohn et al for having drawn the attention of the surgeon to the inflammatory lesions of the small intestine. In retrospect the surgeons reviewed their cases and in this way established an answer as to why an appendectomy did not cure the patient, why obstruction developed, and why fistulæ and tumors formed. Twenty-four articles are cited as describing typical cases of ileitis preceding Crohn's epoch-making article. Among the etiological factors given are: B. coli, B. dysenterial, tubercle bacillus, mycobacterium Johsei, bacterial toxins, viruses, protozoa, metazoa, achylia gastrica, allergy, foreign bodies, heredity and trauma.

Conclusion

The etiology, bizarre symptomatology and surgery of region ileitis are discussed.

The genesis of this disease is being extensively studied but is at the present time unknown.

It has been called by various terms such as: regional ileitis, regional enteritis, Crohn's disease, terminal ileitis, regional colitis, non-specific granulomatous tumor, stenosing ileitis, stenosing terminal ileitis, segmental enteritis, et cetera.

Operation is the treatment of choice. If the involvement of the ileum is not too extensive, resection of the diseased portion is preferable; otherwise a short-circuiting operation had better be done.

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(Continued on page 794)

HISTORY OF MEDICINE IN MINNESOTA

HISTORY OF MEDICINE IN HENNEPIN COUNTY

BY A. S. HAMILTON, M.D.

THE first physician of Hennepin County, or what afterwards became Hennepin County, was Dr. Purcell,[1] who accompanied the army to Fort Snelling, in 1819, as surgeon, and remained here in that capacity for some years. All of the land on the west side of the river, where the major portion of Minneapolis now stands, was part of the military reservation and remained so until 1855, when it was thrown open for settlement. Provisional claims had been made, however, and settlers had been present even previous to that date. The first building[2] between the Mississippi and the St. Croix Rivers was a claim shanty, which was soon replaced by a log house, built by Franklin Steele in July, 1838, on the river bank abreast of the Falls of Saint Anthony. In the fall of 1847 Mr. Steele, who had established his preëmption claim to the site of Saint Anthony, consisting at that time of a blacksmith shop, a carpenter shop and five dwelling houses, one of which contained a small store,[3] began the erection of the first sawmill, which was put into operation in the late summer of the following year. At that time Saint Anthony with Little Canada, a settlement north of Saint Paul, was said to have a population of 571,[4] which we must look upon as having been a very liberal estimate.

In 1849 the population of Saint Anthony nearly doubled, and amongst those who arrived in that year were William R. Marshall, afterward Governor, and his brother. With pioneer promptness they came, hauled logs cut by their own hands in '47 on a previous visit, built two cabins therewith, and in one of them opened Saint Anthony's first real store. William R. Marshall surveyed and laid out the town of Saint Anthony, fourteen and one-half blocks up and down the river, and four blocks back. The street beginning opposite the Falls, now Third Avenue Southeast, was Cedar; then followed Spruce, Spring, Maple, Walnut, Aspen, Birch, and Willow, the last being now named Tenth Avenue Southeast. Up the river and parallel with it, were Pine, Mills, Bay, Linden, and Oak, now, respectively, First and Second Streets Southeast, Central, and First and Second Streets Northeast.

Of the second physician in Hennepin County, we have only a vague and somewhat mysterious record. Colonel J. H. Stevens came to Saint Anthony in April, 1849, as one of a party of ten, seeking a home. "The colony had a doctor, just entering manhood, who has since arrived at the highest pinnacle of his profession. A schoolmaster was also along, the rest were farmers. * * * There were no sick, so the doctor left in disgust. We had no children, so the schoolmaster went to another part."[1] Of this doctor, who came and went almost in a night, no further record can be found though we have searched for it long and carefully.

The first civilian physician of whom we can find any definite mention in Saint

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1. Stevens Lyceum Address, 1856.
2. Statement of Dr. W. W. Folwell.
3. Northwestern Democrat, March 10, 1855.
4. Minnesota Year Book, W. G. LeDuc, December, 1851.

Anthony, was Dr. Ira Kingsley, an herbalist. Dr. R. J. Hill recalls him as a big man with a gray beard, who, as the city's first constable, in 1861 and 1862, used to patrol up and down watching for fires in Bridge Square, which was then the business center. Dr. Kingsley probably came in the Spring of '49, and does not appear at any time to have emphasized his medical attainments, figuring more frequently as a justice of the peace. He may well have been intimidated by the stern founders of Saint Anthony, who apparently felt that the presence of physicians would damage the reputation of Minnesota as a health resort, and strongly discouraged them at every opportunity. This pose on the part of the papers and public speakers is noticeable throughout all the early years of the settlement, and Mr. Goodhue, the brilliant editor of the first paper of the Northwest, the *Saint Paul Pioneer,* says, in an article called "Who are Wanted in Saint Anthony":[5] "Physicians, the *Express* [the Saint Anthony paper] does not want at all for any purpose, seeming to regard them as a fifth wheel of a coach in their profession and incorrigibly idle out of it."

Dr. Kingsley lived in a shack on Hennepin Island, the whole of which he claimed as he had jumped Franklin Steele's previous claim.[6] Later they compromised, and Dr. Kingsley took the southwest part of the Island, beginning near the Falls, and Mr. Steele took the remainder.

In spite of Dr. Kingsley's retiring disposition, and in the face of the opposition of the city fathers to medical men, his services were demanded in at least one emergency, the account of which has come down to us. The founders of Saint Anthony had made no provisions in their arrangements for a natural increase of population and for the conventional idea of womankind that on the occasion of a natural increase the presence of a physician is required. The first time we hear of a call for a doctor was in September, 1849, the result of a charivari at the wedding (the second in the settlement)[7] of Miss Amanda Huse and Mr. Lucius Parker. Across the road from Miss Huse lived Mrs. Godfrey, who at this time was hourly expecting confinement, and, hearing the ungodly noise, she must needs take it into her State-of-Maine head that it was Indians on the warpath, a thought of such disastrous consequences that Mr. Caleb Dorr, then boarding with the Godfreys, was dispatched post-haste for Dr. Kingsley, "Saint Anthony's only physician." Mr. Dorr's hurried exit effectually scattered the revelers. He took a small canoe and rowed to the island, where he found the doctor, but he met an unexpected difficulty when Dr. Kingsley refused to enter a craft which was quite evidently several sizes too small for him. Mr. Dorr, with a courage born of desperation, forced the physician to his knees in the old canoe, and paddled off with him before he had time to change his mind or posture. Says Mr. Dorr: "After a stormy passage [due more to the doctor's temperament than to the weather, we surmise] we arrived in Saint Anthony." Here Dr. Kingsley had the honor of presiding at the birth of the first white child born in Saint Anthony, Miss Harriet Godfrey, who is still with us (1936).

Dr. John H. Murphy, Saint Anthony's first regular physician, came up the river with his wife in the spring of '49.[8] He returned later to Rush Medical College, graduated, and began practice, probably at that time. He is mentioned in various lists of physicians as having become established here in 1850. Evidently he was not practicing in Saint Anthony in September, 1849, when Miss

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[5] Saint Paul Pioneer, June 26, 1851.
[6] Notes on Early Saint Anthony. R. P. Upham.
[7] Old Settlers' Address, Colonel Stevens, State Atlas, February 27, 1867.
[8] Statement of Mr. Caleb Dorr.

Godfrey was born. The first medical advertisement found was in the *Minnesota Chronicle and Register* of September 23, 1850, and reads thus:

> **Dr. John H. Murphy**
> Front Street, a short distance below the mill, St. Anthony, Minn.

The world to which Dr. Murphy came was a very different place from the Minneapolis in which our pleasant paths lie. The west bank was practically an unbroken wilderness, as had been the east bank but a few months before. Goodhue gives us a good picture of Saint Anthony in 1850 when he says:[9]

> "This place stands unprecedented in the record of its march for improvement. Less than ten months ago, after it was founded, the first house was built upon the lot given to the first settler. Now there are nearly one hundred buildings and six hundred inhabitants. The sawmill has four saws with a dam capacity of running eighteen; also a first rate lath machine. There are five stores in the place and one grocery. A fine steamboat is now building to take hundreds of delighted visitors next summer up the romantic Mississippi above the falls."

All around the little settlement was the primeval forest. Mrs. E. A. Chatfield says that in her childhood the boom of the falls was her lullaby in her home at the corner of Tenth Avenue Southeast and Fourth Street, and it is said that the sound was audible in Saint Paul. This seems almost incredible when we view today the remains of the cataract, but we must recall that it was a real fall in 1850, and, besides, there was little competition in the way of noise save that of the mills or a woodman's axe. But stay, we are forgetting another sound that at intervals broke the silence and which most of us have never heard and never shall:

> "Crea-a-k, over one hundred Red River carts driven by dirty looking halfbreeds and laden with furs of all kinds from Pembina and the British possessions to exchange for a return load of groceries and life's necessities have drifted down past our office during the past week. This is no unusual occurrence and hundreds more will go by this season. What queer, quaint things they are, these wooden carts (without a nail or single piece of iron about them) and a sober plodding ox tethered to each with tow and leather strings, not a morsel of grease upon the polished oaken axle, and down the street goes the tortuous line of gypsies, Cr-rr-eak, sque-a-k, cre-r-rr-ea-k, a caravan of grimy pilgrims that seem a chain between civilization and savagism, and between the past and the present."[10]

These carts came down the Anoka road, squawked their way through Saint Anthony to Saint Paul, furnishing en route one of the chief sources of entertainment of the pioneer communities, a combination of movies, circus and brass band, especially the latter, only more so, for it is said they were audible three miles away. As they pursued the uneven tenor (and bass) of their way through Saint Anthony one summer day, their stolid drivers might have seen, as did Judge Lochren (who related it to Dr. Folwell and he to me), Dr. Murphy, happily unconscious of germs and as apathetic in regard to vermin as a modern trench surgeon, sitting on the steps of his office bandaging the heads of some Chippewas wounded in the battle of Shakopee, and surrounded by Indians and halfbreeds.

Here is another picture of Dr. Murphy at work, given by Colonel John H. Stevens, the first white settler on the west bank of the river:

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[9] Saint Paul Pioneer, January 23, 1850.
[10] The Falls Evening News, July 16, 1859.

> "The morning of April 30, 1851, was the coldest for the season ever known in the country. The wind was blowing from the north like a hurricane. The air was full of snow. The river bank was full and the waves were high. It was deemed almost impossible to cross the river either in a bateau, skiff, or canoe. It was necessary that I should have communication with Saint Anthony for the services of Dr. Murphy, who resided there, were required in my family. The aid of three as good boatmen as ever swung an oar, with Captain Tapper at their head, was secured. The question was anxiously discussed: Can any water craft at our command withstand the fierce wind, high waves and swift current? Captain Tapper thought one large bateau could weather the storm, but we were short of hands. Fortunately Rev. C. A. Newcomb, of the Methodist church, on the east side, joined us. He had remained over night with my neighbor, Calvin Tuttle. With much difficulty and some danger the crossing was made and they safely returned with Dr. Murphy. About noon on that bleak, cold, eventful day my first child and the first born white child on the west bank of the Falls, was added to my happy household."

Dr. Murphy would seem to have been of the type of man created for pioneer practice. With unquestioned ability, he possessed, in addition, a fund of vitality, good humor, wit, and high spirits, which are almost as necessary in a pioneer physician as medical skill. He always wore a Prince Albert coat, in one pocket of which he was said to carry a spool of silk, and, if there was any surgery to perform, he would take out the spool, cut off a piece of silk, sharpen his pocketknife on the heel of his shoe, and say to the patient: "This is going to hurt and hurt like Hell, but I can't help it, so look out."[11] Much as they relied upon and valued his professional ability, however, his old neighbors are more apt to dwell in reminiscence on Dr. Murphy's social qualities, and so we hear of how a court,[12] with Murphy as judge, would suddenly find itself in session when a stranger made his appearance in the streets of Saint Anthony, and said stranger would unexpectedly discover that he was arrested for some such crime as spitting on the sidewalk—an impossible feat, not from lack of expectorative power in the pioneers, but owing to the absence of sidewalks. If he were a wise stranger he recognized his obligations and offered to treat the court, which immediately and joyously adjourned *sine die*.

Another glimpse we get of Dr. Murphy on the occasion of the marriage of the erstwhile widow Dorr to Dr. Jodon in '54. No wedding was complete without a charivari, apparently, and the choice spirits of Saint Anthony rallied on this occasion to do honor to the doctor and his blushing bride. Their most strenuous efforts to bring forth the groom, however, were unavailing until some bright citizen proposed the application of a board over the chimney as a powerful persuader. It was. A very irate man appeared, vowed vengeance, and in the morning was still breathing fire and brimstone and seeking to discover the perpetrators of the foul deed. The first person he met in his quest was one of the most confirmed practical jokers in Saint Anthony, which seems to have been well supplied with that article in this early day. The doctor was surprised and pained to learn that the charivariers included in their ranks the elite of Saint Anthony, chief among them Dr. John H. Murphy. Murphy and the others were arrested and appeared next morning in the police court. Dr. Jodon, whatever his medical attainments, certainly lacked a sense of humor. His name appears in lists of physicians sometimes as "B" and sometimes as "Z" Jodon, and I have seen a reference to the two Jodons, though assured by those who should know (Mr. Dorr and Dr. Foster) that there was but one—he came in 1853.

Doubtless, practice was scarce and living was hard, and many of the early

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11. Statement of Dr. R. J. Hill.
12. James Mullen in "Old Rail Fence Corners."

physicians held positions which we can hardly accept other than as evidence of a need to increase their practice. Thus the *Minnesota Republican* of February 7, 1856, announced its gratification that Dr. J. H. Murphy has just been appointed by the County Commissioner of Ramsey County as physician and overseer of the poor of Saint Anthony, but the doctor had but a short time to profit by his new position, for the same paper of March 20, 1856, announces the annexation of Saint Anthony to Hennepin County. On June 24, 1858, Dr. Murphy purchased a stock of drugs and medicine from Mr. George A. Nash, but continued in practice.

Dr. Murphy was born in New Brunswick, N. J., in 1826, and read medicine with Dr. Abram Hull of Lewistown, Illinois. He attended Rush and graduated in 1850. The previous year he had located in Saint Anthony and began practice and made his home there until near the close of the Civil War. In the summer of 1861, when Dr. Stewart, surgeon of the First Minnesota, was captured at Bull Run, Dr. Murphy took his place and served in that capacity for six months. He then became surgeon of the 4th Infantry—connected with the 17th Army Corps, General McPherson commanding—and served as division surgeon most of the time. In the summer of '64 he had a sunstroke and had to come north. He later became surgeon of the 8th Minnesota Infantry operating against the Indians, and served there until the end of the war. During the latter part of this time his family moved to Saint Paul, which was his home after 1864. Subsequent to 1870 he served as surgeon general to the state for many years.

A note of November 1, 1851, says that Dr. Murphy has returned from the National Medical Convention at Saint Louis, where 500 medical men had been in attendance.

The *Saint Anthony Express* of November 1, 1851, introduces to Saint Anthony a man who was to play a very important part in the development of the two towns and to be the pioneer of the profession on the west side of the river, as Dr. Murphy was on the east. This advertisement announces his arrival:

> Drs. Murphy and Ames will continue the practice of his *(sic)* profession
> in Saint Anthony and vicinity. Office—(etc.)

The actual partnership was formed October 27, 1851, and was dissolved sometime in April, 1853, or shortly before that date. And here is the editorial notice which the *Express* condescended to bestow on a mere doctor:

> Dr. A. E. Ames at this time is a resident of Saint Anthony, and it is to be hoped permanently. By a reference to our advertising columns it will be seen he has formed a business connection with Dr. Murphy. Dr. Ames brings with him the esteem and best wishes of a host of friends, among whom are some of the most prominent citizens of Illinois.

Dr. Ames was a graduate in the first class from Rush and came to Saint Anthony from Roscoe, Illinois. He had been assistant secretary of state in Illinois for four years. A volume might be written about Dr. Ames and his beneficent activities in Minneapolis. Stevens says of him: "He held many offices without stint or limit." He most assuredly did, but, after all, perhaps no more beautiful tribute can be paid him than was given by Mrs. Hannah Munson when she said: "He was awful good to poor folks, was Dr. Ames. Never charged them nothing and was as good to them as to richer people." Immediately on his arrival here he filed a claim on the west side of the river, and moved there in 1852.

Dr. Hezekiah Fletcher also came in 1851, and became a prominent citizen of old Minneapolis, though not especially in a medical way. He was the third man to take a residence claim on the west side of the river, as well as the third man to represent Hennepin County in the legislature in 1854; he was the first Justice of the Peace, and was a director of the Hennepin County Bible Society. His name appears occasionally in lists of physicians, but he is said to have been principally interested in real estate. He built a small house on a site which is now Portland Avenue, between Fourteenth and Fifteenth Streets, at that time considered far back in the country.

Prior to 1854, the citizens of the west bank were compelled to accept and forward their mail from the office in Saint Anthony. In 1854 Minneapolis was given a postoffice, and Dr. Fletcher was made postmaster, but the government did not extend the mail route across the river until eighteen months later. The river was crossed only by a ferry, and, during these months, Dr. A. E. Ames, whose professional duties called him to Saint Anthony almost every day, brought the mail over in his hat or coat pocket, and it was distributed by Dr. Fletcher in a little building on the corner of First and Helen Streets.

In 1863 Dr. Fletcher was appointed registrar of the U. S. Land Office, and in 1867 he removed to Missouri and ultimately died in California.

In 1851, too, came Dr. N. E. Morey, whose card "respectfully offers his professional services to the City of Saint Anthony and vicinity. Dr. Morey will attend to all operations in the practice of dentistry when not engaged in the practice of medicine and surgery. Dr. Morey can be found at all hours at his office on Main Street near Mr. Russel's store." Certainly, Dr. Morey was not likely to be caught by the gentleman who is on the lookout for those with idle hands.

Advertisements in these old papers were at times quite flowery, and were, as we shall see later, even poetical. But this one, though not medical, is not so far removed from surgery, since it is the work of the barber, or shall we say a tonsorial artist?

> Mr. Highwarden, Saint Anthony's hair dressing saloon, late from Saint Paul, gives notice to the bearded people of Saint Anthony that he has opened the rooms in their flourishing and enterprising town [subtle flattery from a former citizen of Saint Paul] for the practice of the tonsorial art in all its varieties and manifestations, including plain and ornamental shaving [into what dreams and nightmares of sidebeards, goatees, imperials, and chin draperies does this not lead us?], capillary amputation and shampooing.

What was the fate, one wonders, of this bombastic Highwarden? He sounds as if he had just escaped from one of Dickens' novels.

There would seem to have been no farther addition to Saint Anthony's medical ranks in 1851, which, perhaps, was just as well, since the papers and public speakers were still loudly vociferating that there was no work for them and to stay was to invite starvation. The Saint Anthony paper must have been edited by an early brand of Christian Scientist or else the editor was "blind of an eye," for while his editorials loudly proclaim that no one dies in this splendid climate save of old age, the news items in almost every issue chronicle deaths from tuberculosis. Further light is thrown on this situation by an article of Dr. Mattocks in the *Northwestern Medical and Surgical Reporter* of September, 1871, Vol. 2, No. 3. Mattocks quotes from the *Philadelphia Medical and Surgical Journal* a statement that the climate of Minnesota had changed in the past fifteen years and that, on account of the cutting of the pines, the climate was no longer suitable for tuberculosis. Mattocks denied that there had been any change, and also quoted from the Secretary of the Y.M.C.A. of Saint Paul as follows: "Our Association has spent hundreds of dollars the past year, without counting the days and nights of watching, in providing homes, comforts, and coffins for Christian young men who have come here from Boston in search of health, but in reality have found only a grave." Perhaps the safest deduction from the whole discussion is that the climate never had been especially suited for tuberculosis.

It may be that this unfriendly attitude was not limited to the medical profession, for the *Minnesota Democrat* of July 26, 1856, calls on the citizens to "put the laborer and farmer into power," to scratch the names of attorneys appearing on the tickets, and "to assist in the extermination of all political hybrids whose sole object is their own aggrandizement at the public expense."

However, the doctors would appear to have gone their quiet way, calmly awaiting the issues of life and death. If they received no encouragement from the local press, they were at least not flayed alive, as happened to an unfortunate professional brother in Saint Paul who fell foul of Mr. Goodhue with the following sinister results:

> "Dr. C. Rich and family (he professed to be of the eclectic school of medicine) left by the Nominee last week, being in debt to many people in Saint Paul and especially to the printer. This reminds us of the old maxim, 'Riches take to themselves wings and fly away,' and we cannot help heartily and meekly responding, 'Give us, Oh Lord! neither Poverty nor Riches.' Cheerfully would we forgive any poor fellow in debt who was man enough to say, 'Sir, I owe you, but am poor and I cannot pay you.' As for that man, dressed in black broadcloth, this office will try to have the man's character properly appreciated wherever he may go.
>
> "Dr. Rich is about thirty-three years old, five feet ten inches or eleven inches high, slender, bilious, black hair, black eyes, smells like an apothecary shop, and looks like the ghost of bilious fever. Wherever he finds employment as a physician there will be employment for the undertaker, and, if he does not lose his patients, it will be because he can find none. As a surgeon he would only do to call in case of broken neck or a shot through the heart; or as a physician in the last stages of cholera or consumption when it is too late. But to do him justice, he was a very good collector of his own fees, and would take the last shirt from any poor patient who by accident or miracle survived his treatment."[13]

No doubt the members of the Saint Anthony profession, on reading this, felt that the studied indifference of the local press was not without its compensations.

The year 1852 was an uneventful one as far as the medical profession was concerned, except for the arrival of Dr. Charles L. Anderson, who appears to have been the only addition to the list of physicians. He arrived in May from Indiana. Stevens gives the following account of him:

> "He was a geologist, entomologist and florist of rare industry and attainment. He contributed many articles to the press. Early in the sixties he moved to the Pacific slope. Tarrying a few years in Nevada, he made there a very complete catalogue of flora. For twenty years he has been resident in Santa Cruz, California, where his skill and attainments as a scientist are widely appreciated. His two daughters are talented in a literary and artistic way."

I am indebted to Dr. Thomas S. Roberts for some interesting facts in reference to the relation of Dr. Charles L. Anderson to Henry D. Thoreau. Some time during the year preceding Thoreau's death, he came to Minnesota in search of relief from tuberculosis, lived with a farmer near Richfield, and botanized about Lake Harriet and through that district. In a collection of essays published by F. B. Sanborn in 1917 as a part of his biography, Thoreau speaks frequently of Anderson and of the pleasure he had in knowing him and going about with him.

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[13] Saint Paul Pioneer, September 4, 1851.

Investigation of the local press shows many medical and semi-medical contributions by Dr. Anderson during his residence here. In the *Minnesota Democrat* of October 25, 1856, Dr. Anderson has an article entitled, "Agriculture west of Minneapolis." He speaks of the "Big Woods," the beautiful trees, the different varieties with their Latin names, and prophesies that at some distant time our richest farms will be in these woods.

The *Express* of January 3, 1852, has this item which is not uninteresting as showing conditions in the settlement and also the tone of the press toward physicians:

> "In reply to a letter as to the number of inhabitants of Saint Anthony we can only venture an approximation. Last spring we numbered a thousand. Since then Dr. Murphy informs us he has assisted at seventy births, in all of which both mother and child are doing well. As we have five other physicians in the place, allowing each an equal number would give us a natural increase of three hundred and fifty. [Note the sophistry, as Dr. Murphy had an overly generous portion of the practice of the city.] In regard to the health of the place, a most satisfactory report may be given. People who comply strictly with the laws of health and do not employ a doctor never die except of old age."

This is one of the ways in which the Saint Anthony census was padded.

Here is another piece of news from a February, 1852, paper:

> "The Legislature of Minnesota is composed of three farmers, five lumbermen, eight merchants, one innkeeper, four bookkeepers, two lawyers, one mason, one painter and two physicians. - - - Drs. Day and Murphy are the first disciples of Æsculapius that ever had the honor of representing the people of Minnesota in the collected wisdom of the territorial fathers."

Hennepin County (on the west side only of the Mississippi) was organized October 21, 1852. Colonel Stevens says:[1]

> "At the election held at my house eleven days previously, there were seventy-three votes polled which comprised about half the voters. At a mass meeting held previous to the election the citizens nominated, irrespective of party, the following: A. E. Ames, Representative, etc. * * * All of these candidates positively refused to stand but the meeting positively refused to excuse them. They were elected and were the first officers of Hennepin County. The first physician in the county was Dr. A. E. Ames, who dates this part as his home from October 18, 1851."

A territorial temperance society was instituted in this year by Drs. Fell (dentist), Fletcher, and Ames, and the latter, during the same year, was made contract surgeon at Fort Snelling.

The year 1853 saw three additions to the medical ranks—Drs. A. E. Johnson, Z. or B. Jodon (he of the charivari), and Dr. J. A. White. We have few data in regard to Jodon, but Johnson became one of the prominent physicians. He was an inveterate smoker and always had a long meerschaum pipe hanging from his mouth. The following story is told of him, and may serve to illustrate some of the rough-and-ready ways of pioneer physicians. On one occasion when Johnson was testifying in court, the judge announced the hour of closing, but Johnson said: "Hold on a minute, I have a little more to say," and went on with his testimony, and, when done, said to the judge: "Now, that's all, you can go."

Dr. Johnson was born in Oneida County, New York, in 1825. As a young man he came as far west as Illinois, and then returned to New York to study medicine at Columbia. He was persuaded by Dr. Ames to come to Saint Anthony, and continued to practice here forty years. He was a naturalist and ethnologist and, according to Neill, the founding of the Minneapolis Academy of Natural Sciences was largely due to Dr. Johnson, though Drs. Simpson, Ames, W. H. Leonard and Hatch were also active, the latter especially in ornithology.

The *Falls Evening News* of June 4, 1859, reports that the "popular chess factory of Dr. Johnson in a freshet had been wrenched from its moorings and carried down the stream," from which we assume that the doctor was also a chess enthusiast.

The *Minnesota Republican* of October 19, 1854, has a card from Dr. Johnson, calling attention to the fact that he gives special attention to the eyes, which is the first reference I have found to local specialism in medicine in our modern sense of the word "specialism," though there are many instances of doctors giving special attention to "chronic diseases," "scrofula," "neuralgia," et cetera. On February 22, 1855, Dr. Johnson announced himself as an "occulist," and, at the same time we find him dropping into poetry in a friendly way, thus:

> Dr. A. E. Johnson, Occulist *(sic)*, would say to those who exclaim with Milton:
> A drop serene hath quenched my orbs
> Come then and
> Take thou some new infection to thine eye
> And the rank poison of the old will die.

Evidently, Dr. Johnson was here vaguely suggesting our modern views of vaccine therapy.

Campbell's Directory of 1875 gives the following eloquent testimony of the interest of the early physicians in scientific matters. Minneapolis Academy of Natural Sciences: A. E. Johnson, President; S. S. Peckham, Vice President; A. F. Elliot, Secretary; P. L. Hatch, Corresponding Secretary; Charles Simpson, Curator.

The *Minnesota Republican* of April 30, 1857, reports that Drs. Johnson and Le Boutellier of Saint Anthony have become editors of the Agricultural Department of the *Minnesota Democrat* and the *Saint Anthony Express*, respectively.

Dr. J. White was a graduate of the Medical College of Brunswick, Maine, and practiced here to his death, which occurred in 1856, at the age of thirty-three.

In the *Saint Anthony Express* of February 4, 1854, we find the following note:

> "We requested recently of Dr. Ames a statement of the number of deaths in Hennepin County the past year. The following was handed us by him in reply thereto. We believe Dr. Ames is the only practicing physician in the county and our readers may be assured it is correct. Hennepin County has a population of over 2,000 and it appears there were six deaths during the past twelve months in the whole county. * * * The County of Hennepin is situated on the west side of the Mississippi and between the Minnesota and the Crow Rivers, containing an area of 25 to 35 miles."

(To be continued in December issue.)

President's Letter

THE coöperation of the doctor is required in these days in many matters of public interest that are not exclusively medical problems.

Civic bodies are calling upon the medical profession more and more frequently for advice and assistance and the Minnesota State Medical Association has responded with two new committees within the last few months.

One of them is the committee to study further legislation for the control of potential sex criminals. This committee was requested by the House of Representatives at the last session of the Legislature. It will work with a corresponding committee from the Minnesota State Bar Association in the hope of finding a permanent solution in the law to the serious problems of sex crime.

Another is the Committee to Study Motor Vehicle Accidents. The work of this committee will have particular reference to practical tests for alcohol in order to assist in coping with the problem of the drunken driver. The committee will make its own studies of the subject and coöperate with police authorities to help in eliminating the drunken driver as a factor in automobile fatalities.

Still another committee of immense importance to the public health at this juncture will be appointed by the incoming president after the first of the year to promote vaccinations and immunization among the children of Minnesota. Physicians all over the state recognize the need of a concerted campaign for this purpose on the part of organized medicine. It is hoped that this committee will study practical ways and means and make concrete recommendations to county societies, which should be the agencies to set the work in motion.

There is a double fitness in the choice of the respiratory diseases as subject of the month for November. It is in November that the common cold, influenza and the pneumonias become acute seasonal problems and November signalizes also the opening of the annual Christmas Seal campaign for the control of tuberculosis.

The Minnesota State Medical Association has coöperated in this campaign for many years and wholeheartedly endorses the public education campaign which is financed by the sale of Christmas Seals.

Through the Christmas Seal and the educational campaign it finances, the citizens of the nation have been aroused to the problem of tuberculosis. Today, as a result of the effort, doctors and health departments are no longer working alone on the tuberculosis problem. The whole body of citizens is participating in the fight with tangible results in greatly reduced death rates from tuberculosis.

We are greatly indebted to the Minnesota Public Health Association for its aid in our campaign and for its coöperation with the practicing physician and the State Board of Health in the control of tuberculosis in Minnesota.

George Earl, M.D., *President*
Minnesota State Medical Association.

EDITORIAL

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BUSINESS MANAGER
J. R. BRUCE

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THE STORY OF SULFANILIMIDE

FOR years an extensive search had been going on without success for a drug which would kill bacteria in the human organism without harming tissue cells. With the exception of a few specific remedies for such diseases as malaria and syphilis, proposed drugs proved a disappointment.

The story of the discovery of the therapeutic value of sulfanilimide and its allied drugs in the treatment of a variety of infections, as told by Long and Bliss,* is the story of the gradual addition of evidence of the efficiency of these dye-like preparations until it became incontrovertible that the long looked for remedy had been discovered, making an epoch in the history of medicine.

Certain dyes have been known to be bactericidal *in vitro* since 1913. A period of almost twenty years was to follow before experimentaion was to prove the effectiveness of prontosil *in vivo*.

Sulfanilimide was first synthesized in the dye industry in Germany in 1908. Experimental work with prontosil was first carried out in Germany in December, 1932, but was not reported until Domagk made his epoch-making contribution in the *Deutsche Medizinische Wochenschrift* of February 15, 1935. In the meantime, however, a few German clinicians had been using the drug with some success, evidently emboldened by the demonstration of its value in preventing the evolution of fatal hemolytic streptococcic infections in mice and curing streptococcic infections in rabbits when given by mouth.

The first report of the remarkable clinical qualities of prontosil was that given by Foerster, May 17, 1933, before the Dusseldorf Dermatological Society, when he reported the cure of a ten-months-old infant suffering from staphylococcic septicemia. Strangely enough, the drug was first used in a staphylococcic infection and then apparently only in desperation.

Following the report of experimental and clinical use of prontosil in the *Deutsche Medizinische Wochenschrift* of February 15, 1935, the French and English became interested. Unable to obtain the drug from Germany, the French synthesized similar drugs known as septazine and rubiazol and most of their reports, until recently, are concerned with the use of these drugs.

In 1936 reports of experimental and clinical use of prontosil began to appear in England.

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*Long, Perrin H., and Bliss, Eleanor A.: The clinical and experimental use of sulfanilamide, sulfapyridine and allied compounds. New York: Macmillan, 1939.

Prontosil was found to be ineffective against streptococci *in vitro,* but had growth-retarding power in the blood of patients. It was Whitby and others in England who first demonstrated the value of sulfapyridine in experimental pneumonococcic infections in mice.

In the United States prontosil was first used in 1935 by Dr. A. Ashley Werch in the Babies Hospital in New York. A few other clinicians used it the same year but it was difficult to obtain. No mention of the drug appeared in the literature until an abstract of a French article appeared in the June 13, 1936, issue of the *Journal of the American Medical Association.* It was not until 1936 that laboratory and clinical investigations were seriously undertaken in America. In November of that year Long and Bliss reported, before the Southern Medical Association at Baltimore, the slight bactericidal action of sulfanilimide *in vitro* and its bacteriostatic action *in vivo* and confirmed European reports on prontosil, prontosil S and sulfanilimide.

The Council on Pharmacy and Chemistry of the A.M.A. suggested the name sulfanilimide April 17, 1937, and accepted the drug July 31, 1937.

Chemotherapy is in its infancy, but it is not unlikely that it will continue to replace established therapeutic procedures and will be found to be effective in an increasing number of infections. The profession cannot, however, be blind to the occasional unfavorable reactions encountered in the use of the various compounds.

THE NURSING PROFESSION

THE nursing profession has its difficulties like every other profession and occupation. The demand for nurses is seasonal and, while compensation during employment is adequate, the yearly average income of most trained nurses is not commensurate with their value. With the onset of the depression there was widespread unemployment in the nursing ranks, and even suffering. With the closing of many training schools in Minnesota there has been evidence of a dearth of available trained nurses at times in certain localities. At the present, the supply is abundant.

The whole trend of the training of nurses in recent years has been to increase the preliminary requirements as well as to raise the quality of the curriculum in training. Some have thought the trend has gone too far in the matter of nonessentials. The matter lies in the hands of the nurses, and perhaps no one can blame the leaders in the profession for attempting to turn out a highly finished product. Certainly the medical profession is trying to do the same thing.

The greater the professional training the higher the financial compensation justified. No physician believes the trained nurse is overcompensated when she cares for certain acutely ill individuals. Other factors, however, must be considered.

A goodly proportion of the population simply cannot afford the services of a trained nurse, and for that matter, the fees that a physician may feel his service is entitled to. Most physicians adjust their fees to the patient's ability to pay, but that is not allowed by the nurses' organization and is admittedly not quite a comparable procedure. Also, certain patients do not need the services of a highly trained nurse, and yet they need someone to carry out the simple procedures entailed in the care of those suffering from a great variety of chronic illnesses.

As a result, the more or less self-styled practical nurse has come into prominence. In most cases, with little education and no formal training, this type of nurse has met a very definite demand at a fee considerably lower than that paid the trained nurse. In a sense the practical nurse is in competition with the trained nurse, but just as truly she meets a different need. She finds her employment for the most part because of satisfactory services rendered, or through some employment agency separate from the trained nurses' organization.

Impressed by the undesirability of so many uneducated and untrained women caring for the sick, the New York legislature has passed a bill requiring certain qualifications and providing for licensing for practical nurses. The law also provides penalties for those acting in this capacity without license. The desirability of legislating against a woman with little qualification caring for the sick for compensation may be open to objection, however desirable the establishment of a group to be known as practical nurses with certain minimal education and training may be.

Other states, Minnesota included, will doubtless follow the practical application of this law with interest.

As a matter of fact, there is a very definite need in both rural and urban localities for a type of nurse with some training but available at a rate lower than the trained nurse. It would be well if some solution of their training and registration could be evolved. Perhaps this is a problem the medical profession should help to solve. —C.B.D.

MINNESOTA MEDICAL FOUNDATION

A GROUP of medical alumni headed by Dr. E. S. Platou, president of the Minnesota Medical Alumni Association, have had drawn up articles of incorporation for a Minnesota Medical Foundation. The purpose of the Foundation is the establishment of an organization, composed largely of medical alumni, which will be able to work for the betterment of the medical school of the University of Minnesota.

The purposes of the Foundation, as stated in the articles of incorporation, include activities for the betterment of the community (meaning the state at large) through the furtherance of undergraduate and graduate medical education and medical research. Specific activities as stated at a preliminary meeting of some hundred medical graduates, held October 10 at the Continuation Center, included financial aid for needy medical students, financial assistance in keeping outstanding members of the medical faculty from going elsewhere because of offers of higher salaries, publicity activities in disseminating information through members throughout the state, et cetera.

Membership will consist of four groups: Foundation Associates to consist of contributors of $1,000 or more; Life Members to include those contributing $100; Supporting Members who pay annual dues to be determined at a later date; Student Members who will pay nominal dues of $1.00. The first three groups will be voting members.

In addition there will be a Board of Trustees, twelve in number, the majority to be medical alumni. There will be a president, vice president, secretary and treasurer. The first officers will be: Dr. E. S. Platou, president; Dr. M. B. Visscher, vice president; Dr. R. L. Wilder, secretary; and Dr. J. C. Litzenberg, treasurer.

One of the functions of the Foundation will be the issuing of a bulletin, not for publication of scientific articles, but primarily to acquaint members with medical school activities, thus bridging a gap which has existed since the medical school began. Only a relatively small group of medical graduates have been able to keep in close touch with the medical school and the majority of medical alumni have had absolutely no contacts.

No other medical school has attempted any such organization as this proposed Foundation. Those who heard of the project for the first time at the October 10 meeting were most favorably impressed, and the proposal received the enthusiastic approval of the Minnesota Medical Alumni Association at its annual meeting October 14. This Foundation will offer a tangible opportunity for the alumni and interested friends of the Medical School of the University of Minnesota to exert an influence for the improvement of medical education and research. Through a separate corporation they will be able to direct the expenditure of funds in accordance with the wishes of their donors and in the light of the best judgment of the membership of the Foundation.

The Foundation has as its most important immediate objective the reëstablishment of contact between alumni and the medical school. Its members and officers believe that when the work of the school is better understood there will be many physicians and other public spirited citizens who will be anxious to lend support to its further work.

Regional Ileitis

(Continued from page 781)

review of cases. Proc. Staff Meetings Mayo Clinic, 13:535-38, (Aug. 24) 1938.
3. Coffey, R. J.: Pathologic manifestations of regional enteritis. Proc. Staff Meetings Mayo Clinic, 13:541-44, (Aug. 24) 1938.
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MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
W. F. Braasch, M.D., Chairman

SICKNESS INSURANCE—PENNSYLVANIA; CALIFORNIA

The Medical Society of the State of Pennsylvania is about to launch its own voluntary insured medical service on a statewide scale.

Information about the Pennsylvania plan is appended to an extensive printed report of the Pennsylvania Survey of Sickness Service and Facilities which has just been published under the title, "Are the Citizens of Pennsylvania Neglected When Sick or Injured?"

The survey presents detailed findings in each county and subjoins a review of the extensive program of the state medical society and cooperating agencies to take care of the sick and needy in Pennsylvania.

The general program duplicates in most respects the program pursued by Minnesota physicians with the exception of the fact that the physicians in Minnesota will not experiment with voluntary sickness insurance, at least until such insurance has been demonstrated as successful in other states or until the need for it in Minnesota is so obvious that society officials feel justified in moving into these uncharted fields.

In Effect in 1940

Enabling legislation which cleared the way for it in Pennsylvania was passed last spring. The plan will probably be put into effect in January, 1940. It offers much the same benefits as the Michigan plan (detailed in this section last month). Premiums are comparable and the service is limited to single persons with incomes of not more than $30 weekly, to married couples with incomes of not over $45 weekly, and to families of three or more with an aggregate income of not more than $60.

Hospital Service in California

In this connection it is also interesting to note progress in California with a considerably cheaper, state-wide, medically sponsored voluntary plan.

In California, for a $1.00 registration fee and $2.50 a month, or $2.00 a month plus the regular fee for the first two visits, the single patient receives not only medical care for most illnesses but also hospital service. The upper income limit of eligibility is $3,000 yearly. Ninety cents of the patient's premium goes to the hospital association for hospital service. All physicians are invited to join by paying a $5.00 initial fee and more than 5,000 are said to have enlisted in the service.

Radicals Want Government Service

The political situation, as always, is an important factor in this development in California. Californians, themselves, predict that compulsory sickness insurance will be a major issue in 1940 regardless of the success of the voluntary system. In the meantime, the support for the state financed system seems to have been split. Moderates are disposed to see how the voluntary system works before taking legislative action. Radicals want a state supported system, come what may.

". . . WHERE THE BEST WORK IS DONE"

In all discussions of medical care and its adequacy there is a tendency to look for abstruse new reasons for age-old conditions; to intrude complicated sociological observations into relationships that are essentially simple and obvious.

Thus, when the student of sociology and economics finds a high percentage of illness and preventable deaths he is quite likely to cast about for irrelevant reasons. He digs up the fact, for instance, that 90 per cent of the population in the given area has an income of less than $800 a year. Or that there is only one doctor to every 1,000 persons in the area or that there is only one hospital bed to every 1,000 persons. All of these facts are of interest, certainly. But they leave out of account a simple and obvious probability. If there is too much illness and death, judged by the common standard in any locality, and if the rates are rising, the first question to ask is surely, what about the quality of medical service in that area?

Morbidity Rates Go Down

If the doctors of a district or a state or a nation are alert, well-trained, conscientious and unhampered, morbidity and mortality rates are nearly always found to go down regardless of other factors. When the quality of medical service is lowered, the rates go up.

This simple relationship was pointed out emphatically by Dr. Grant Fleming, director of the Department of Public Health and Preventive Medicine at McGill University, in an estimate of the situation in Canada before a recent meeting of the Canadian Public Health Association.

"We find," said Dr. Fleming, "that for a period of years the infant mortality rates in some provinces are much higher than those in other provinces. The same may be said in regard to tuberculosis mortality rates. These rates show principally that medical care in its broadest sense is inadequate in certain provinces.

Bears Repetition

"It is so easy to offer as an explanation for such an undesirable state that there are some inherent economic conditions in certain areas and provinces that account for the high rates. The interesting observation is that the lowest rates are always in the areas where the best work is being done. It is quite true that local conditions may increase the difficulties. But that is all. If medical care is adequate, good results will follow as surely as sunshine follows rain."

This is a truth that will bear repetition now, as government bureaus gather their forces for dealing legislatively and administratively with morbidity and mortality problems in the United States.

If doctors and hospitals are allowed the freedom and support they need to do good work, morbidity rates will continue to fall; lives will be saved in spite of inconceivable difficulties. If they are hampered in their work and standards are lowered—even though new facilities are built and more doctors are hired—no real improvement can be looked for in the health of the people.

Their First Concern

No one, least of all medical men, discounts the rôle played by poverty in sickness, nor the need for adequate hospital beds and a sufficient number of physicians. Figures support them, however, in their contention that the first concern as doctors should be to protect and improve the quality of practice since quality is the *sine qua non* in every country for the control of sickness and death.

ILLEGAL AND UNSATISFACTORY

Minnesota's system for care of the relief client is well established in the law and it has operated since the enactment of the "choice-of-vendor" clause to the benefit of both patients and doctors.

Shortage of relief funds has been reported in many counties of the state, however, and a few county welfare boards are now reported to be dallying with the temptation to restore the county physician for care of relief patients as a means of cutting relief costs.

To the hard-pressed welfare board member, any way that offers ostensible savings looks desirable. Usually he has had no experience with the county physician plan himself. He is only vaguely aware of the objections to the system and he is quite likely to listen to advisers of the board who believe that the choice-of-vendor clause in the law can be circumvented by technicalities.

It is the hope of officials of the Minnesota State Medical Association that a clear and definite statement defining the law and the policy of the Division of Social Security may soon be made by state officials.

In the meantime physicians in every community where the going is difficult should do what they can to assist relief officials. They should work closely with the board at all times so that costs can be kept at a minimum. They should also point out to county officials the illegal and altogether unsatisfactory nature of the county physician plan for the care of relief patients.

MINNESOTA REGULATION UPHELD

Citizenship has been required for some time in order to obtain a license to practice medicine in Minnesota. This requirement is not in the statutes. However, it is a regulation of the State Board of Medical Examiners, instituted and enforced because the Board was certain that it would be upheld in the courts if it should be brought under judicial review.

It is, therefore, especially interesting to Minnesotans to note that the matter was brought into a state court for the first time in Texas recently, according to the *Journal of the American Medical Association* of October 14, and that the decision of the district court of Travis county upheld the regulation.

Citizenship was required by statute in Texas but the constitutionality of the statute was challenged by a Mexican physician on the ground that the constitution of the United States guarantees the right of an alien to follow any common occupation under the same condition that it imposes on citizens.

The court ruled that the practice of medicine is not a common occupation but a profession impressed in many instances with official and semi-official duties.

Citizenship is required by statute in Arkansas, Delaware, Florida, Georgia, Idaho, Louisiana, Nebraska, New Hampshire, Texas, New Jersey, South Dakota and Wyoming and by regulation of the examining board in Alabama, Iowa, Kansas, Kentucky, Michigan, Minnesota, Missouri, Montana, Nevada, North Carolina, Oklahoma, South Carolina, Tennessee, Washington and West Virginia.

First papers are required by law in another group including New York, and by regulation in still another group. Neither citizenship nor first papers are required in Arizona, California, Indiana, Vermont, or the District of Columbia.

TOLERANCE

(Monthly Editorial Prepared by Medical Advisory Committee)

While attending recent medical meetings in various parts of the State, one was struck immediately by the excellence of the programs, by the unusually friendly attitude of the members one toward another, and by the ability of the men present not only to absorb the commonplace things of medicine but also the fundamentals of intricate practice as outlined to them by the more learned in the particular branch under discussion. This shows reading, study, and thinking far beyond the average.

No longer can the term "old fogy" be used to deride the older man, or "young upstart" be applied to the younger one. They both speak the same language and apply the same thoroughness to medical and surgical problems.

The younger members of the medical profession can well afford to read several chapters from the "book of experience" of the older men, thus gaining quickly that intangible something which only years of contact with the complexities of medical practice can give to them; while the older men may gain much from the younger by absorbing and applying in some measure the enthusiasm which is the grandest possession of youth.

There is one disturbing factor, however, which the Medical Advisory Committee wishes to bring to the attention of the profession. That is the tendency of pre-medical practitioners—internes, fellows, and others closely associated with larger institutions—to asperse the work and ability of men long on the firing line. There seems to be a feeling among these young men that, since the patient has entered their institution, he must immediately be advised that the care he has been given in the past is entirely wrong and, therefore, open to censure and criticism.

Many of them forget that they, too, may some day not be so fortunately situated as to have consultants available at their beck and call; that the x-ray equipment may be miles away when the fracture is to be reduced; that a lonely farm house has been the birthplace of many an obstetrical problem. Valuable experience will be gained, there, under trying conditions, and the old saying, "Whatsoever a man soweth that shall he also reap," will come true for them, too.

It might be well for us all to forget past treatment and attend strictly to the problem at hand when consulted by the patient of another. We should defend the reputation of another as though it were our own.

B. J. B.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Julian F. Dubois, M.D., Secretary

Willmar Physician Sentenced to Term Not to Exceed Four Years for Criminal Abortion

Re: State of Minnesota *vs.* Iver S. Benson

Iver S. Benson, fifty-eight years of age, entered a plea of guilty on September 28, 1939, in the District Court at Willmar, Minnesota, to an information charging him with the crime of abortion and was sentenced by the Honorable G. E. Qvale, Judge of the District Court, to a term of not to exceed four years at hard labor in the State Reformatory at St. Cloud. Dr. Benson was arrested on August 17, 1939, at Willmar, where he maintained his office as a physician and surgeon, on a warrant charging Dr. Benson with manslaughter in the first degree, following the death on August 15, 1939, of a thirty-two year old married woman at Montevideo, Minnesota. At the time of his arrest Dr. Benson admitted that he had performed a criminal abortion upon this woman and that he had received the sum of $25.00 for his services, although he had asked for $50.00. The abortion was done in the office of Dr. Benson at Willmar, on Monday, August 7, 1939. Shortly thereafter the woman became critically ill and a Montevideo physician was called in, who immediately removed her to a hospital. Upon being arraigned in Municipal Court at Willmar, August 18, 1939, Dr. Benson demanded a preliminary hearing which was set for August 24. Bail was fixed in the sum of $7,500.00, which Dr. Benson furnished. On August 24, Dr. Benson waived his preliminary hearing and was held to the District Court.

The investigation also disclosed that another Montevideo woman has been seriously ill since December 14, 1938. This woman stated, in a sworn affidavit, that Dr. Benson had performed a criminal abortion upon her on that date. It has since been necessary to hospitalize this woman on two occasions in order that she might have surgical treatment for the injuries sustained by her at the time of the performance of the criminal abortion. This patient weighed 119 pounds at the time of the abortion and only 74 pounds in July, 1939.

Dr. Benson has been served with a citation requiring him to show cause, on November 3, 1939, before the Minnesota State Board of Medical Examiners, why his license as a physician and surgeon should not be revoked. The records of the Minnesota State Board of Medical Examiners disclose that Dr. Benson was born in 1881, in Jackson, Minnesota, and that he graduated in medicine from the College of Physicians and Surgeons in Chicago, in 1906. He was licensed January 18, 1907, in Minnesota by reciprocity. For the past eight years he has practiced at Willmar and prior to that, for a number of years, he practiced at Montevideo.

The Minnesota State Board of Medical Examiners wishes to acknowledge the prompt and capable handling of this case by Mr. Roy A. Hendrickson, County Attorney of Kandiyohi County, Mr. Clarence A. Rolloff, County Attorney of Chippewa County, and Sheriff Paul E. Anderson of Willmar, Minnesota.

Otter Tail County Woman Sentenced to Jail Term for Examining Eyes and Selling Glasses

Re: State of Minnesota *vs.* Mary Louise Paulsen

On September 22, 1939, Mary Louise Paulsen, 59 years of age, entered a plea of guilty to an information charging her with the crime of practicing healing without a basic science certificate. Following a statement of the facts in the case to the Court by Mr. Wm. P. Berghuis, County Attorney of Otter Tail County, and Mr. Brist in behalf of the Minnesota State Board of Medical Examiners, the Honorable Anton Thompson, Judge of the District Court, sentenced Mrs. Paulsen to three months at hard labor in the Otter Tail County Jail. Mrs. Paulsen was arrested by Sheriff J. C. Henkes of Otter Tail County, on a warrant charging her with examining eyes and fitting glasses without being properly licensed. When taken before Justice Frank C. Barnes of Fergus Falls, Mrs. Paulsen waived a preliminary hearing and was held to the District Court under $500.00 bond, which she was unable to furnish. She stated that she desired to plead guilty, with the foregoing result.

Upon being questioned by Judge Thompson, Mrs. Paulsen admitted that she had no training in the examination of eyes or the fitting of glasses, except for a period of one week at Chicago, Illinois, where she stated she received some instructions from an optometrist by the name of H. E. Baker. Mrs. Paulsen, at the time of her arrest, was living in a trailer at Leaf Lake about seven miles north of Henning. She would go from farm to farm examining eyes and fitting glasses. When she made a sale she sent the prescription to the Home Service Optical Company at 3737 Fremont St., Chicago, Illinois. Mrs. Paulsen stated that Baker was connected with this company. Mrs. Paulsen received 30 per cent of the selling price of the glasses as her compensation. The glasses sold within a range of $4.00 to $16.00. She stated to the Court that she first came to Minnesota in 1929, on a visit and that she had resided in Otter Tail County for the past two years. She stated that her husband resided at Clear Lake, Iowa. Mrs. Paulsen has a previous conviction, in 1937, in Otter Tail County for petit larceny.

Judge Thompson made it very clear to the defendant that the Court would not tolerate any such unlawful practices and emphasized the necessity of people having specialized training and a proper license if they are going to examine eyes and fit glasses. Mrs. Paulsen seemed quite crestfallen at being sentenced to the County Jail, but the Court advised her that she should have considered that before she proceeded to violate the laws of the State of Minnesota. Judge Thompson told Mrs. Paulsen that after she had served thirty days and had refunded the money to those persons who had not yet received their glasses, and upon assuring the Court that she would absolutely refrain from practicing healing in any manner in the State of Minnesota, the Court would consider an application on her part to suspend the balance of her sentence.

The Minnesota State Board of Medical Examiners wishes to specifically mention the splendid coöperation received from Mr. Berghuis, County Attorney of Otter Tail County, and Sheriff Henkes. Both of them assured the Medical Board that they do not want any unlicensed individuals practicing healing in Otter Tail County and that they will coöperate in every manner in such cases.

Two Saint Paul Men Plead Guilty to Forging Medical Prescriptions for Alcohol

Re: State of Minnesota vs. Benda
Re: State of Minnesota vs. Foote

Following a joint investigation made by the Liquor Control Commissioner of Minnesota, the Minnesota State Board of Medical Examiners and the Saint Paul Police Department, evidence was procured that

(Continued on page 801)

◆ OF GENERAL INTEREST ◆

Dr. C. L. Eckhardt has announced the opening of an office in Austin, Minnesota. Dr. Eckhardt is a graduate of the University of Minnesota school of medicine, class of 1935, and served his internship at Asbury Hospital, Minneapolis. During the past three years he has been associated with Dr. Arthur F. Bratrud, Minneapolis.

* * *

Dr. Carl E. Johnson of Pine River has received word of his appointment to the Medical Reserve Corps of the United States Army. Dr. Johnson has discontinued his medical practice at Pine River but his family will continue to make their home there.

* * *

Work is under way on a building which, when completed, will house a modern medical clinic in Morris. The clinic will be owned and operated by Doctors L. R. and L. B. Parson of Elbow Lake.

* * *

Dr. J. J. Westra, who for the past two years has been a fellow of the Mayo Clinic at Rochester, has taken over the practice of Dr. C. L. Farabaugh at Owatonna.

Dr. Farabaugh has moved to Minneapolis, where he is associated at the University Hospital in the Department of Ophthalmology.

* * *

Dr. L. E. Koskela, physician and surgeon, opened an office in Sebeka, November 1. Dr. Koskela is a graduate of the University of Minnesota and served his internship at St. Mary's Hospital, Duluth.

* * *

Dr. F. E. Ellison of Monticello is erecting a new office building on Highway 25. The new building will be of Cape Cod design, thoroughly modern, and with landscaped grounds surrounding it.

* * *

Dr. Wayne S. Hagen has opened an office at 2209 Johnson Street N. E., Minneapolis. Dr. Hagen is a graduate of the University of Minnesota, 1934. After spending one year in the Kansas City, Missouri, General Hospital, he was for two years with CCC in Kansas, and spent one year at the Army Hospital, Fort Leavenworth, Kansas. He has been resident physician at Asbury Hospital, Minneapolis, the past year.

* * *

Dr. J. E. Westrup of Maple Lake has moved to Lanesboro, where he will be associated in practice with Dr. F. A. Drake. He is a graduate of the University of Chicago and Marquette University. He served his internship at the Chas. T. Miller Hospital in Saint Paul.

* * *

Dr. R. A. Maves, who has been practicing medicine in Montgomery since last April, has accepted a position with the public health department in Seattle, Washington.

* * *

Dr. E. W. Wahlberg, who has been engaged in the practice of medicine at Morgan, Minnesota, the past two years, has moved to Sleepy Eye, where he has taken over the practice of Dr. James L. Ryan. Dr. Ryan, who has a fellowship in obstetrics and gynecology at the University of Pennsylvania, has moved to Philadelphia.

* * *

Dr. Graham Gable Smith, son of Dr. and Mrs. Vernon D. Smith, of Minneapolis, and Miss Mary Burns, were married in Minneapolis in September. Dr. and Mrs. Smith are now at home in Fulda, Minnesota.

* * *

Dr. Thomas H. Dickson was elected president of the board of directors of the Saint Paul Y.M.C.A., October 13. A member of the board for twenty-five years and treasurer for the past ten years, he headed the membership campaign in 1934. His father, Thomas H. Dickson, Sr., was also at one time president of this organization.

* * *

The following Minnesotans were awarded fellowships in the American College of Surgeons, October 16 at the annual meeting in Philadelphia: Theodore R. Fritsche, New Ulm; Joseph B. Gaida, Saint Cloud; Earl C. Henrikson, Herman; Michael Koller and Louis Robert Koller, Minneapolis; Clarence G. Ochsner, Wabasha; Virgil E. Quanstrom, Brainerd; and John Master Waugh, Rochester.

* * *

DIRECTORY OF MEDICAL SPECIALISTS

The Advisory Board for Medical Specialties will issue, in December, the first Directory of Medical Specialists listing about 14,000 specialists certified by the twelve American Boards and the two affiliate Boards in the Specialties. The volume will present information about the Advisory Board, detailed biographical listing of the Diplomates, and will give full information regarding admission.

It is expected the Directory will be published every two years. It should prove valuable to physicians in referring patients.

The subscription price is $3.50 and the volume may be ordered directly from the Columbia University Press, 2960 Broadway, New York, N. Y., or through the office of the Directing Editor, Dr. Paul Titus, 1015 Highland Building, Pittsburgh, Pa.

In Memoriam

Guy R. Caley
1874-1939

DR. GUY R. CALEY, Princeton, Minnesota, died September 26, 1939, following several years of disability from a heart ailment.

Dr. Caley was born at Princeton, January 9, 1874, the son of Dr. David A. Caley. Following the death of his father in 1887, the family moved to Faribault, where Dr. Caley attended Shattuck. After graduating from Shattuck he entered the University of Minnesota medical school, where he received his medical degree in 1900.

After a year's internship at Saint Joseph's Hospital, Saint Paul, he began practice at Princeton.

In 1902 Dr. Caley married Mary Strum of Chippewa Falls, Wisconsin. Mrs. Caley died a year later. For several years thereafter Dr. Caley lived with his cousin, Clair Caley, in Princeton.

In 1918 Dr. Caley married Edna Hayes of Saint Paul. Mrs. Caley passed away March 23 of this year.

Dr. Caley's favorite hobby was gardening. He loved flowers and for years had one of the finest gardens in the village. He was an authority on the growing of many varieties of flowers.

Dr. Caley was a kindly man, and, like his father was too generous for his financial welfare. His memory will long be cherished by scores of warm friends in his community.

Dr. Caley is survived by two brothers, Earl Daniel and Louis Collins, both of Seattle, and a daughter, Mary Ann. Dr. Caley's two sisters, Martha and Catherine, preceded him in death. Catherine was formerly head mistress at Saint Mary's Academy at Faribault.

Charles T. Granger
1870-1939

Dr. Charles T. Granger of Rochester, Minnesota, was born in Olmsted County, Minnesota, July 30, 1870. He practiced in Rochester from 1892 until his death, October 4, 1939, with the exception of two years at McGregor, Minnesota, from 1928 to 1930.

Dr. Granger graduated from Hahnemann College, Chicago, in 1892, and later studied at Johns Hopkins.

In 1935 Dr. Granger published a series of articles entitled "The Saga of a Country Doctor" which attracted widespread attention.

Martha B. Moorhead
1865-1939

Dr. Martha B. Moorhead of Minneapolis, was born in 1865 and died October 14, 1939.

She attended Wellesley College and received her medical degree from the Woman's Medical College in Philadelphia in 1892. Her internship was served in the New England Hospital for Women and Children in Boston.

In 1894 Dr. Moorhead became superintendent of Northwestern Hospital, Minneapolis, but after two years entered private practice. A year was spent in postgraduate work in Vienna, after which she specialized in gynecology.

At one time Dr. Moorhead taught courses for nonmedical students at the University of Minnesota in public health and nursing care. She was an affiliate member of the Hennepin County Medical Society and the Minnesota State and American Medical Associations.

Dr. Moorhead is survived by a sister, Mrs. H. B. Nesbit, of Washington, D. C., and a brother, W. Paul Moorhead, of Minneapolis.

Edward L. Paulsen
1883-1939

Dr. Edward L. Paulsen, who lived at 121 W. Elmwood Place, Saint Paul, but practiced in Minneapolis, where he was a member of the Hennepin County Medical Society, died October 7, 1939, at the age of fifty-seven.

Dr. Paulsen was born in 1883. He graduated from the University of Minnesota Medical School in 1909. He was a member of the College of Surgeons and a members of the Masonic Order. For a number of years he was a member of the Board of Deacons of Calvary Baptist Church, Minneapolis.

Dr. Paulsen is survived by his widow and a son, John E. Paulsen.

J. C. Rothenberg
1860-1939

Dr. J. C. Rothenberg of Springfield, Minnesota, died October 15, 1939, at the age of seventy-nine.

Born April 5, 1860, at Amhurst, New York, Dr. Rothenberg graduated from the University of Michigan in 1885. He took postgraduate work in New York City in 1896 and again in 1916.

On December 15, 1936, a banquet was tendered in his honor in commemoration of the completion of fifty years of practice. Dr. Rothenberg was an affiliate member of the Redwood-Brown County Society, the Minnesota State and American Medical Associations.

Thordur Thordarson
1865-1939

DR. THORDUR THORDARSON of Minneota, Minnesota, died August 2, 1939, at the age of seventy-four.

Thordur Thordarson was born at Stao i Hrut a fordi, Hunavatrissysla, Iceland, January 3, 1865. When he was eight years old his family came to this county and located in Shawano County, Wisconsin, where the doctor's father died the following year.

Among the doctor's fondest recollections of Iceland were those of his schoolmates in Reykjavik. He had been a leader among them, and the young men who stayed on in the homeland after he left for the new world included several destined to become distinguished leaders of their nation.

The interchange of letters, and occasional greetings sent from anniversary reunions in later years, kept Dr. Thordarson in touch with such distinguished classmates as Dr. Gudmundur Hannesson, teacher in Iceland's school of medicine; Dr. Gudmundur Björnsson, for years a parliamentary leader and the nation's chief health officer; Eggert Briem, member of Iceland's supreme court, and several other similarly situated leaders.

Remaining for a time at the farm home which members of his family had established near Gardar, Dr. Thordarson began a brief career in electrical engineering by enrolling in that course at Cornell University, at Ithaca, N. Y. He aided his younger brother, C. Hjörtur, when the latter was laying the foundation for the inventive and engineering career which brought world renown in his field as head of the Thordarson Electric Company in Chicago.

Before entering upon his medical course, Dr. Thordarson did electrical work for some time, working while electrical street car systems were first being installed in such metropolitan centers as the Twin Cities, St. Louis and San Francisco. Returning to Chicago, he took the medical course at the University of Illinois, receiving his M.D. degree there in 1896 and his license to practice in 1897. In the latter year he came to Minneota, took up the practice of medicine, and continued it as long as his health permitted, continuing to make Minneota his home until his death.

Dr. Thordarson, with the late Rev. B. B. Jónsson, was one of the founding editors of "Vínland," Icelandic monthly published in *The Mascot* plant from 1902 to 1908. The periodical was the only Icelandic newspaper published in the United States, and it held an enviable reputation among Icelanders in the home country as well as in Canada and the United States. In the literary criticisms and editorial features he contributed to that periodical, Dr. Thordarson showed genuine writing ability and the same remarkable versatility of intellect as characterized his other performances.

Dr. Thordarson was married on February 6, 1901, to Sigurbjörg, daughter of Mr. and Mrs. Sigurbjörn Asbjörnson of Selkirk, Manitoba. They made their home in Minnesota, and to them three children were born: Wilhjalmur, who died January 8, 1937; Maria Adalbjorg of Gary, Indiana, and Sigurbjörg, who died August 12, 1905. Mrs. Thordarson passed away July 10, 1905.

During the World War, Dr. Thordarson enlisted in the United States Army and served as medical officer at Camp Funston. He was a member of the Lyon County Medical Association, the Minnesota State Medical Association, and the American Medical Association.

The only surviving member of the Thordarson family now is the doctor's brother, C. H. Thordarson of Chicago, Illinois.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

(Continued from page 798)

resulted in the prosecution of Frank Benda, thirty-five years of age and Walter Foote, twenty-three years of age, for forging and presenting fictitious medical prescriptions for alcohol to registered pharmacists. Due to the fact that the evidence indicated that the alcohol was used for their own consumption and not for resale, they were permitted to plead guilty to a misdemeanor and were each fined $50.00 or thirty days in the Saint Paul Workhouse; each paid the fine. They were admonished by Judge Finehout that a repetition of this offense would bring a much more severe sentence. Benda and Foote have been employed for some time as meat cutters for the National Tea Company, Benda living at 391 Selby Ave., Saint Paul, and Foote at 1265 Dayton Ave., Saint Paul. Up until the spring of 1939, they had been obtaining their alcohol at the Sundry Drug Store at Rice and Summit Ave., in Saint Paul, but their source of supply was shut off when Sundry was sentenced to thirty days in the Saint Paul Workhouse for a violation of the State Liquor Control Act in connection with the filling of fictitious medical prescriptions for alcohol. Shortly thereafter it was discovered that similar prescriptions were being filled at the River Road Pharmacy at 14-27th Ave., Minneapolis, operated by one Harold Smetana. Practically all of the prescriptions bore Saint Paul addresses and had been forged by Benda and Foote, both of whom admitted that they obtained the prescriptions from Smetana, and this was also admitted by Smetana. Some of the physicians' names that were forged to these prescriptions are as follows: Drs. A. A. McDonald, C. Godwin, B. T. Thompson, B. C. Thomson, B. C. Clark, F. C. Clark, George G. Clark, W. W. Johnson, A. C. Caldwell, Gordon Weed and M. G. Goldbend.

The Minnesota State Board of Medical Examiners adopted the policy, several years ago, of coöperating with the State Liquor Control Commissioner in enforcing the law with respect to medical prescriptions for alcoholic liquors. Due to the fairness of the legislature of Minnesota, and other public officials, the medical profession enjoys the privilege of writing bona fide medical prescriptions for alcoholic liquors without any requirement of a special license fee or governmental order book, or any other red tape, and a registered pharmacist is permitted to fill these prescriptions upon the payment of a $5.00 annual license fee. Obviously, unless this law is respected by the medical profession and the pharmacists, other steps will undoubtedly be taken by the legislature to correct this evil. It is very apparent that the large majority of the medical profession and the registered pharmacists, comply with the law, but there is still a small number of physicians, pharmacists and others, who continue to violate this law. The Medical Board has attempted to give suitable publicity to the position taken by the Board, and to the fact that medical men will be prosecuted in the Courts for a violation of this law, and in addition, they subject themselves to a suspension or revocation of their license as physicians, one physician already having had his license suspended for a period of three months.

Benda was arrested on October 5, and entered a plea of guilty on October 7, 1939. Foote was arrested on October 11, and entered a plea of guilty on October 12, 1939.

MINNESOTA PUBLIC HEALTH ASSOCIATION

Friday, November 3, is the date of the 33rd annual meeting of the Minnesota Public Health Association, with daytime sessions in Saint Paul and the dinner meeting in Minneapolis.

"War and Tuberculosis" will be the subject of an address to be given by Dr. J. A. Adamson of Winnipeg, Canada, professor of medicine, Manitoba University, and medical director, St. Boniface Sanatorium, St. Vital, Manitoba, at the Christmas Seal dinner to be held at the Hotel Nicollet at 6:30 p. m. At this same session Governor Stassen will tell of Minnesota's peace-time program against tuberculosis. Dr. S. A. Slater, president of the Minnesota Public Health Association, will give a memorial address on Dr. Charles H. Mayo, who was honorary life president of the Association. Dr. F. J. Hirschboeck will be toastmaster. Greetings from the Hennepin County Tuberculosis Association will be extended by its president, Dr. Stephen H. Baxter, and from the National Tuberculosis Association by Dr. J. A. Myers, former president of the National Association.

At the noonday session in Saint Paul, Dr. H. E. Hilleboe will speak on "Observations on My Trip to Europe."

Dr. E. A. Meyerding, executive secretary of the Minnesota Public Health Association, is in charge of arrangements.

SCOTT-CARVER SOCIETY

The Scott-Carver Medical Society held its first fall meeting October 10, at Mudcura Sanitarium, Shakopee.

Dr. Arthur Kerkhof, of Minneapolis, addressed the members on "New Aspects of Endoscopy." Dr. Norman Nelson, also of Minneapolis, spoke on "Problems of Pernicious Anemia."

WEST CENTRAL SOCIETY

The thirty-seventh annual meeting of the West Central Medical Society was held in Morris, Minnesota, October 11, 1939. After dinner at the Merchants Hotel the guest speaker of the evening was Dr. Macnider Wetherby of Minneapolis. He talked on different treatments of arthritis.

Superintendent Ray Amberg of the University Hospital explained the relationship between the University Hospital and the different welfare boards throughout the state. He stated the function of the University Hospital was more to obtain teaching material for the medical school than to take care of relief patients.

Mrs. Virginia Liebeler gave a review on hospital insurance and how it worked out in the large hospitals in the cities. She explained her talk with charts and graphs.

Election of officers for the coming year resulted as follows: President, Dr. E. M. Elsey, Glenwood; Vice President, F. W. Behmler, Morris; Secretary-Treasurer, Dr. H. Linde, Cyrus; Censor for three years, Dr. A. F. Giesen, Starbuck. Dr. C. I. Oliver, Graceville, was elected delegate to the state convention, with Dr. Chas. Bolsta, Ortonville, as Alternate. Drs. Robert Merrill, Morris, John A. Magnuson, Graceville, and C. R. Christenson, Starbuck, were accepted as members of the society.

SOUTHERN MINNESOTA MEDICAL ASSOCIATION

The meeting of the Southern Minnesota Medical Association held September 18, 1939, at New Ulm, was well attended, 129 physicians having registered. An attendance of 137 physicians and their wives was reported at the banquet.

Officers elected for the ensuing year are: Dr. James Morrow, Austin, president; Dr. Charles Koenigsberger, Mankato, first vice-president; Dr. E. A. Kilbride, Worthington, second vice president; Dr. N. W. Barker, Rochester, secretary-treasurer.

MEDICAL SERVICE FOR CIVILIAN CONSERVATION CORPS

Medical service for the Civilian Conservation Corps has, in the past, been furnished by the medical section of the Officers' Reserve Corps with the exception of a few doctors who were employed on a contract basis. A recent decision of the Director of the CCC and the War Department permits the employment of doctors who are not Medical Reserve officers in this service.

Doctors needed for this service may be now employed under the rating of civilian employees. Under date of October 10, 1939, the initial salary was changed from $2,600 per annum to $3,200 per annum. No quarters for families are provided, and the doctor will be required to pay for his food at camps. Temporary quarters for the doctor will be provided at the camps for a nominal fee. Doctors selected for this service will be required to pay their own travel expenses to the nearest district headquarters, where they will be put on temporary duty for instructional purposes before being sent to camps. Travel expenses incurred in the transfer of doctors from the district headquarters to camps or in the transfer from one camp to another will be paid by the Government. If the services rendered are satisfactory, the employment is more or less permanent.

The principal duties at camps consist of the medical care of the enrollees and the practice of preventive medicine. To be eligible for this servce, the doctor must be legally qualified to practice medicine and physically able to perform the duties involved.

All doctors interested in this type of service are requested to submit their applications to the office of the Surgeon, Headquarters Seventh Corps Area, Federal Building, Omaha, Nebraska, giving date when available and preference of assignment in the following states: Minnesota, North Dakota, South Dakota, Iowa, Nebraska, Missouri, Kansas, and Arkansas.

WOMEN'S AUXILIARY

Mrs. A. C. Baker, Fergus Falls, *President*
Mrs. E. V. Goltz, 2259 Summit Avenue,
Saint Paul, *Publicity Chairman*

Mrs. A. C. Baker, president of the State Auxiliary, attended the Northern Minnesota Medical Association's annual meeting at Detroit Lakes, Minnesota, September 8 and 9. Mrs. Wm. B. Roberts of Minneapolis, past president of the Auxiliary, also attended the meetings with Dr. Roberts and they were the house guests for the week end of Dr. and Mrs. J. F. Norman of Crookston, Minnesota.

Clay-Becker County

The Women's Auxiliary to the Clay-Becker Medical Society entertained the wives of the visiting doctors, attending the Northern Minnesota Medical Association meeting held September 8 and 9 at Detroit Lakes, Minnesota. The wives were guests of the Clay-Becker Auxiliary at a luncheon and bridge given at the Park Hotel on September 8. Prizes were won by Mrs. Brown of Crookston, Mrs. Simison of Barnesville, Mrs. Hans Johnson of Kirkhoven and Mrs. Ederer of Mahnomen. Members from other Auxiliaries throughout Northern Minnesota as well as the local Auxiliary enjoyed the talk given during the afternoon by the state president, Mrs. A. C. Baker, of Fergus Falls. Following the afternoon party, the women met with their husbands at the annual banquet. While the business meeting for the doctors was held in the morning of September 9, members of the Clay-Becker Auxiliary took the wives for a drive about the lakes. The doctors and their wives joined in a golf tournament in the afternoon at the Detroit Lakes Country Club, closing the annual session.

* * *

Members of the Clay-Becker Auxiliary are sponsoring a sale of articles made by the patients of the Sand Beach Sanatorium, which will be held during December. Sales will be held at Moorhead, Minn., and at Detroit Lakes.

* * *

Mrs. J. J. Ryan of Saint Paul, third vice president of the State Auxiliary has returned from San Francisco, California, where she attended the National Council of Catholic Women as a delegate from the Guild of Catholic Women of Saint Paul. She visited also in Los Angeles and El Paso, Texas, where she visited the Carlsbad Caverns, and with relatives in New Orleans and Oconomowoc, Wisconsin. In Chicago she conferred with members of the National Board of the Woman's Auxiliary relative to her work as National Historian.

* * *

Stearns-Benton Auxiliary

The Stearns-Benton Medical Auxiliary have made plans for a very interesting and worthwhile year. The first meeting of the season was held Thursday, September 21, at the Mohr hostess house at 6:30 p. m., with the state president, Mrs. A. C. Baker of Fergus Falls, as guest of honor. The business meeting was presided over by the president, Mrs. T. N. Fleming, with reports on *Hygiea* given by Mrs. J. C. Buscher and a report on layettes given by Mrs. M. J. Kern. A budget committee was appointed with Mrs. T. W. Hovorka as chairman and Mrs. William Friesleben and Mrs. M. J. Kern, members. The Auxiliary has decided to sponsor the tuberculosis contest again this year and they have made tentative plans for a rummage sale. Mrs. T. N. Fleming and Mrs. J. B. Gaida gave reports on the state convention which was held in May in Minneapolis. Mrs. A. C. Baker was the guest speaker and brought before the group an outline of the work as proposed by the State Auxiliary for the coming year, stressing organization and membership. She also stated that a statewide program of legislation would be manifest during the coming year because of the crisis through which the medical profession is passing at present. A delightful musical program was given by members of the Technical school. Additional guests for the evening included Mrs. S. J. Raetz of Watkins and Miss Mary Baker, daughter of Mrs. A. C. Baker of Fergus Falls.

* * *

Washington County Auxiliary

On June 13, Mrs. F. G. Landeen was hostess to the Washington County Medical Auxiliary at her home, 724 Martha St., Stillwater. Ten members were present. The regular meeting preceded the annual reports. Officers elected for the coming year included: President, Mrs. E. Sydney Boleyn; vice president, Mrs. F. M. McCarten; secretary-treasurer, Mrs. Ray Johnson. The first meeting of the new year was held in October.

MEDICAL BROADCAST FOR NOVEMBER

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 11:00 o'clock every Saturday morning over Station WCCO, Minneapolis (810 kilocycles or 370.2 meters) and Station WLB, University of Minnesota (760 kilocycles or 395 meters).

Speaker: William A' O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota. The program for the month will be as follows:

November 4—Tuberculosis
November 11—Pneumonia
November 18—Common Cold
November 25—Nutrition and the Teeth

BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

The Health Insurance Doctor. His Rôle in Great Britain, Denmark and France. Barbara N. Armstrong. 264 pages. Price, $3.00, cloth. Princeton, N. J.: Princeton University Press, 1939.

An Introduction to Medical Mycology. George M. Lewis, M.D., Member American Dermatological Association, Inc., Fellow American College of Physicians, American Medical Association, New York Academy of Medicine, etc.; and Mary E. Hopper, M.S., Assistant in Mycology, Skin and Cancer Unit, New York Post-Graduate Medical School and Hospital, Columbia University. 315 pages. Illus. Price, $5.50, cloth. Chicago: Year Book Publishers, 1939.

A Topographic Atlas for X-Ray Therapy. Ira I. Kaplan, B.S., M.D., Director Radiation Therapy Department, Bellevue Hospital, Director Division of Cancer Department of Hospitals, City of New York, Clinical Professor of Surgery, New York University Medical College, et cetera; and Sidney Rubenfeld, B.S., M.D., Associate Visiting Radiation Therapist, Bellevue Hospital, Instructor in Surgery, New York University Medical College, et cetera. Illus. Price, $4.00, cloth. Chicago: Year Book Publishers, Inc., 1939.

Primer of Allergy. Warren T. Vaughan, M.D., Richmond, Va. 140 pages. Illus. Price, $1.50, cloth. St. Louis: C. V. Mosby Co., 1939.

Sketches in Psychosomatic Medicine. Smith Ely Jelliffe, M.D., Consulting Neurologist to Manhattan State and Kings Park Hospitals, New York. 155 pages. Price, $3.00, stiff board cover. New York: Nervous and Mental Disease Publishing Co., 1939.

Textbook of Nervous Diseases. From the Fifth German Edition. Robert Bing, Professor of Neurology, University of Basel, Switzerland. Translated and enlarged by Webb Haymaker, Assistant Clinical Professor of Neurology and Lecturer in Neuro-Anatomy, University of California. 838 pages. Illus. Price, $10.00, cloth. St. Louis: C. V. Mosby Co., 1939.

Psychobiology and Psychiatry. Wendell Muncie, M.D., Associate Professor of Psychiatry, Johns Hopkins University, Assistant Psychiatrist Henry Phipps Psychiatric Clinic, Johns Hopkins Hospital. Foreword by Adolf Meyer, M.D., LL.D., Sc.D., Professor of Psychiatry and Director of the Department of Psychiatry, Johns Hopkins University. 739 pages. Illus. Price, $8.00, cloth. St. Louis: C. V. Mosby Co., 1939.

Synopsis of Pediatrics. Third Edition. John Zahorsky, A.B., M.D., F.A.C.P. Professor of Pediatrics and Director of Department of Pediatrics, St. Louis University School of Medicine, and Pediatrician-in-Chief St. Mary's Group of Hospitals, etc.; assisted by T. S. Zahorsky, B.S., M.D., Instructor in Pediatrics, St. Louis University School of Medicine and Assistant Pediatrician to St. Mary's Group of Hospitals. 430 pages. Illus. Price, $4.00, flexible binding. St. Louis: C. V. Mosby Co., 1939.

MICROBIOLOGY AND PATHOLOGY. Charles F. Carter, B.S., M.D., Director of Carter's Clinical Laboratory, Dallas, Texas, and consulting pathologist for several hospitals. Second edition. St. Louis: C. V. Mosby Company.

This book is an outgrowth of Bacteriology for Nurses by the same author. A second part dealing with the principals of pathology has been added and the original work on bacteriology has been considerably revised. The two parts of the book are organized along the widely used outlines for text books on bacteriology and pathology. The author has constantly kept the educational status of his student in mind. The ground is logically and thoroughly covered in both basic sciences. The book can be recommended as a text for the student nurse.

Arthur H. Wells.

THE ART OF ANÆSTHESIA. By Paluel J. Flagg, M.D. 6th edition, revised. 491 pages, Illus. Philadelphia: J. B. Lippincott Co., 1939.

In this, the sixth edition of his well-known work, Dr. Flagg has the active experience of a quarter of a century since the first edition was published to guide him in stressing the things of real importance in the field of Pneumatology. The book is technical, of course. Everything is condensed and tabulated. Nevertheless, it is still interesting and readable. The author injects just enough of his vigorous personality to give it a humanistic flavor. Nowhere is this better illustrated than in the fine chapter on "The Point of View of the Patient." Speaking of the poor in the great hospitals and dispensaries: "If we would be compensated we must see an image of the Almighty in their presence. We must feel the unspoken thanks which illiteracy cannot utter."

From a technical standpoint the discussion and illustration of the newer methods of intratracheal anesthesia might be singled out for special commendation but it would seem to me that the entire field is exhaustively examined and clearly presented.

C. H. Schroeder, M.D.

DISEASES OF THE SKIN. By Richard L. Sutton, M.D., Sc.D., L.L.D., F.R.S. (Edin.), Professor of Dermatology, Univ. of Kansas, School of Medicine and Richard L. Sutton, Jr., A.M., M.D., L.R.C.P. (Edin.), Associate in Dermatology, Univ. of Kansas, School of Medicine. 1,549 pages. Illus., $15.00. St. Louis: C. V. Mosby Co., 1939.

The tenth edition of Suttons' dermatological work has just arrived and a careful review of its presentations reveals a very worthwhile work. The text is forward, plain, explicit, ample and appropriate. The illustrations are remarkable. The photography is something to be highly comended, showing in detail as much as it is possible to show skin lesions and all are faithful representations of the pathology reviewed. The authors went far and wide to get photographs of each individual entity and have succeeded far beyond anything in print so far as we know. The descriptions covering these illustrations are very graphic, clear and to the point.

The authors follow the usual plan of discussing each condition; first, etiology, then the pathology, symptomatology and treatment, and it is so written that not only is it a very reliable reference for the men doing special work in dermatology, but it makes an excellent guide for the general practitioner, and it is not too much to say that the average man should be able to recognize sixty per cent of the dermatology which he sees in his practice with the aid of a work such as this.

Especially to be commended is the treatment wherein all useful remedies are carefully listed and appropriately stressed. The book also discusses the more scientific developments covered by recent research, and attached to each chapter is an excellent bibliography of the work covered in these particular chapters.

All in all, the two Suttons, father and son, have done a noble service to the medical profession in presenting it with such a scientific and skillful textbook.

E. Z. Shapiro, M.D.

THE ROCKEFELLER FOUNDATION—Annual Report for 1938, 49 West 49th Street, New York City, N. Y. 515 pages. Illus.

This volume, 1¼ inches thick, abounds in reports of all the services which are world-wide in extent. In the Treasurer's report a total of $157,339,992.30 was devoted to the vast uplift enterprises of this remarkable institution. The Foundation's largest commitment during 1938 in the field of Natural Sciences was a conditional appropriation of one and a half-million dollars to the University of Chicago toward the establishment of a $2,000,000.00 endowment fund for research in the biological sciences. Harvard received $100,000.00 toward research in Physical Chemistry in its Medical School. In the Far East, principally in China, the Foundation to date of its report has appropriated about $49,000,000.00; the greater part in connection with the Peiping Union Medical College. Many applications to the Foundation for aid (two thousand or more) were declined, a large proportion being not within the scope of Foundation policy.

In the International Health Division, under the direction of Dr. Wilbur A. Sawyer, the program is broad, the primary activities being: (1) a search for new knowledge directly applicable to disease prevention; (2) coöperation in investigations of diseases of importance to public health; and (3) demonstrations of the applications of new knowledge. $2,200,000.00 was devoted to this program. Virus diseases received a large share of attention, the ultimate goal being prevention. Yellow fever vaccintaion is one of the agencies in process.

In the department of the Medical Sciences, psychiatry has received considerable financial encouragement through certain researches within such medical schools as the University of Chicago, Columbia University, Washington University, Cornell, Mandsley Hospital of London, the Neurological Center of Brussels and many others.

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CONVINCING RECORD OF EFFECTIVENESS
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*"Treatment of Acute Anterior Urethritis with Silver Picrate," Knight and Shelanski, American Journal of Syphilis, Gonorrhea and Venereal Diseases, Vol. 23, No. 2, pages 201-206, March, 1939.

JOHN WYETH AND BROTHER, INC. • PHILADELPHIA, PA.

Public Health teaching and research in maternal health and other educational projects participate in liberal material support. Sixty-eight fellowships in the medical sciences were granted in 1938 to individuals in Belgium, China, Hungary, Iceland, Italy, Java, Lithuania, Peru, Poland, Switzerland and many other countries.

The extensive and far-reaching progressive program in the Natural Sciences, the Social Sciences and the Humanities and the activities of its Research Aid Fund for Deposed Scholars reveal the broad scope of The Rockefeller Foundation. A perusal of its annual report is recommended.

Arthur N. Collins, M.D.

TEXTBOOK OF HEALTHFUL LIVING. Revised Edition. By Harold S. Diehl, M.A., M.D., Sc.D. Cloth. Price $2.50. 634 pages. New York: McGraw-Hill Book Company, Inc., 1939.

Doctor Diehl's book, "Healthful Living," was published first in 1935. This book was written for the general reader, but was used as a textbook in many colleges. The revised edition, which is now off the press, is designed as a college text for hygiene courses. The book has been considerably lengthened, the order of subject matter development changed, and new chapters added on "Modern Parenthood," "Community Health," and "Organized Health Work." A well-selected bibliography is included with each chapter. A valuable addition in the appendix is the "Report on Communicable Disease Control of the Committee on Research and Standards of the A.P.H.A."

The practitioner will be struck by the fact that this book seems to anticipate very well the questions people ask on various health subjects. The style is interesting and the book layout is refreshing rather than fatiguing. The discussion of such topics as exercise, stimulants, sex life, mental hygiene, is almost unique in being conservative, free of dogmatism and crusading, in presenting a sound, "pro and con" viewpoint, and withal leaving a wholesome impression. Likewise commendable is the fact there is no great detailing of such topics as vitamins and endocrines beyond practical needs, for in these fields knowledge is so fluid and intricate that details cannot well be maintained in mind by the lay person, even if once learned. The book discusses effectively the need of selecting and using a family physician and of maintaining high medical standards. The reviewer believes this to be the best available book for its purpose.

C. J. P.

TREATMENT IN GENERAL PRACTICE. By various British authors. With a preface by Reginald Fitz, M.D., F.A.C.P., 2 vol., 680 pages. Illus. Price $7.50. Boston: Little, Brown and Company, 1939.

This book, first published in England in 1936, is a collection of specially written articles which appeared in the *British Medical Journal.* They were written by various well known clinical teachers. The first volume deals with acute infectious and cardiovascular diseases; the second with more chronic conditions such as those affecting the nervous system, rheumatism, metabolic diseases, kidney diseases and disorders of the blood forming organs. In addition, the treatment of such symptoms as melena, dyspepsia, constipation are discussed.

The text is very readable and each subject is dealt with briefly but thoroughly. The directions given are simple and clear. A moderate number of prescriptions are included. The drugs recommended, however, all bear their British trade names and manufacturers' names, which for the most part will be unfamiliar to the American reader. Therapeutic measures which add much to the comfort of the patient sick at home are abundantly described. Little or no mention is made of the use of sulfanilamide or sulfapyridine. This is probably due to the fact that the articles were written prior to 1936 when these drugs were relatively unknown.

The reader of these volumes will gain much knowledge of British methods of treatment and will find much of practical value which does not appear in American texts of similar nature.

W. D. Coventry, M.D.

CORRESPONDENCE

Biography of Dr. Harvey Cushing

Mrs. Cushing has requested me to prepare a biography of her husband and I should be most grateful to anyone who wishes to make letters, anecdotes or other memorabilia available.

Copies of all letters, no matter how brief, are desired, and if dates are omitted it is hoped that, when possible, these may be supplied (*e. g.,* from the postmark). If original letters or other documents are submitted, they will be copied and returned promptly.

A new Medical Library building is being erected at the Yale University School of Medicine to receive Dr. Cushing's library and collections, including his letters, diaries and manuscripts. Any of his friends who wish, now or later, to present correspondence, photographs or other memorabilia for permanent preservation among the Cushing papers will receive the appreciative thanks of the University.

John F. Fulton, M.D.
Yale University School of Medicine
333 Cedar Street, New Haven, Conn.

MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

Volume 22 DECEMBER, 1939 No. 12

THE DIAGNOSIS OF VIRUS DISEASES*

THOMAS FRANCIS, JR., M.D.
Professor of Bacteriology and Director of Laboratories,
New York University College of Medicine
New York City

TO A GREAT extent the difficulty surrounding the diagnosis of virus diseases lies in the fact that the clinical pictures represented by them have not been clearly defined. In many instances the dissection of clinical syndromes into etiological entities has just begun. This is particularly emphasized in the case of the bacteriologically sterile infections of the central nervous system and the group of respiratory infections which include the common cold, grippe and influenza. The situation has many parallels in the field of bacterial diseases. Consider the development of knowledge concerning intestinal infections in the latter part of the 19th century or, more recently, the gradual clarification of the diagnosis of pneumonia by correlation of clinical pictures with demonstrable etiological agents.

We think of the diagnosis of virus diseases as something solely dependent upon the laboratory, requiring intensive training and highly specialized technics. But in some of the best known of the virus diseases the diagnosis is almost entirely based upon clinical criteria. Smallpox, measles and chickenpox are obvious examples and are so because their recognition is aided by eruptions which are readily seen and can be visibly distinguished. Nevertheless, the majority of virus infections still remain within the realm in which the clinical criteria for early diagnosis are as yet inadequate. And since the principle of differentiating diseases upon an etiological basis is so completely established in the field of acute infections, there is dissatisfaction with any classification which identifies them merely as symptom-complexes.

The procedures for the diagnosis of bacterial diseases have developed gradually and with their development the clinical pictures have taken form. The same will undoubtedly hold in virus diseases. In virus studies a different set of clubs is used. While much time is spent in the rough and in traps before reaching the green, there are, however, certain guides which make the trees and long grass less unfriendly and certain telltale marks which enable one to keep his eye on his own invisible ball.

Methods of Isolation and Preliminary Identification

The methods used in the diagnosis of virus diseases are based upon certain attributes of the viruses themselves, and the application of these principles to the isolation and identification of a particular virus represents merely specific variations in the general procedures.

In the identification of bacteria great attention is given to the type of culture media in which an organism grows best, to its growth characteristics, its morphology and staining qualities, and to serological reactions which tend to identify it. A similar set of procedures is followed in studies of viruses with the exception that to a great extent the test tube is replaced by a living animal, tissue extracts are replaced by living cells and the simple smear is replaced by microscopic sections. Thus, we chart the species of animals which the virus is able to infect and the symptoms which it produces in each susceptible species. In most instances there is a sharp selectivity. Moreover, a virus tends to display a distinct affinity for certain organs, rendering it important that the various routes of injection be tried before concluding that a given animal is not susceptible. On the basis of these affinities a rough classification has been made: those which affect the skin, such as variola, vaccinia, herpes, varicella, are spoken of as dermatotropic; those which primarily attack the nervous system, such as rabies, poliomyelitis and the encephalitides, are called neurotropic; those with greatest predilection for the respiratory tract, influenza, common cold, psittacosis, distemper, are termed pneumotropic; still others in which the abdominal viscera bear the brunt of the damage as with the liver in yellow fever and Rift Valley fever may be called viscertotropic. There are also the viruses which give rise to tumor formation. In many of these instances there is a generalized infection in addition to the tendency to localize in a single organ where the major damage occurs. Furthermore, the characteristics may vary from species to species and may be influenced by the route through which the virus is introduced.

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In addition to the selectivity of viruses for species of animals and for certain organs in the animal body, specific viruses may exert a characteristic effect upon specific cells within that organ; thus, poliomyelitis classically destroys the anterior motor neurones; louping ill, the Purkinje cells of the cerebellum; influenza, the respiratory mucous membrane; yellow fever, the liver cells.

The viruses are further identified by the type of cellular reaction they elicit in a given location—necrotic, proliferative, hyperplastic, or exudative.

These selective affinities of viruses for specific animals, organs and cells represent the selective media and the fermentative reactions of the bacterial world, which enable one to place a recently isolated strain in one group and exclude it from another.

Apart from the changes enumerated, some virus infections are characterized by the presence, in infected cells, of bodies which are distinctively stained. In some cases they are present in the nucleus; in others, they are situated in the cytoplasm of the cell. These structures, known as inclusion bodies, are usually acidophilic and their distribution in the cells of an infected animal is almost as valuable evidence in the identification of an invading virus as fingerprints in the case of the midnight marauder. An outstanding illustration of the significance of inclusion bodies in diagnosis occurs in rabies, where the demonstration of Negri bodies practically constitutes the diagnostic test. In psittacosis studies, the demonstration of L.C.L. bodies in the spleens of infected mice is also used as diagnostic evidence of the nature of the disease.

On the basis of the studies of Goodpasture,[19] Rivers,[30] and others the inclusion bodies appear actually, in vaccinia and fowlpox at least, to represent accumulations of virus particles which may be obtained in pure suspensions. These smaller particles have been called elementary bodies. They are within the range of microscopic visibility, and may be agglutinated by specific sera. They have been subjected to chemical analysis, revealing a complex structure. Finally, there is evidence that a single particle will produce infection.

In addition to the pathological evidence, some indication of the classification of a virus may be obtained by determination of the size of infectious agent. The development of graded collodion membranes[5,9] has yielded a method by which the relative sizes of different viruses can be ascertained. Under these conditions it has been shown that viruses range in size from those of foot and mouth disease and yellow fever, which approach the dimensions of a protein molecule (10 to 17 mu), to those of vaccinia and psittacosis, which are 175 to 250 mu in diameter and are visible. Others occupy intermediate positions. Knowledge of the size of an unidentified virus obviously serves, therefore, to indicate which known viruses of similar sizes and pathogenicities one must consider.

The foregoing methods are those employed in the isolation of a virus but they also yield valuable preliminary information as to the group of viruses to which the unknown agent may belong and suggest the more likely ones from which it should first be differentiated or with which attempts should be made to identify it.

The final step in identification of a virus consists in testing the resistance of animals known to be immune to certain viruses of similar characteristics with the newly isolated agent or, conversely, testing animals immune to the unidentified virus with strains of known viruses. Since, however, there are obvious difficulties in carrying out these tests unless all materials are readily available, an indirect approach is more commonly employed. Sera of animals known to be immune to various viruses are tested for their capacity to protect against the virus in question—thus demonstrating the presence or absence of specific neutralizing antibodies. In either case the presence of cross immunity is taken to indicate the nature of the virus. If, then, the serum of the patient from whom the original material was obtained is found to possess, in convalescence, antibodies which were absent at the onset of illness, it is considered a reasonable inference that the disease was actually related to the virus isolated.

Studies of Respiratory Disease

The problem of epidemic influenza has been studied from many points of view with results which have never been fully accredited or reproducible in the hands of different workers. The entire field of upper respiratory infection was reopened with increasing knowledge of virus infections. Psittacosis, formerly thought to be due to Nocard's bacillus, was shown by the work of Bedson,[6] Krumwiede,[21] and Rivers and Berry[31] to be caused by a filterable virus transmitted from parrots to humans. The virus could be adapted to mice and monkeys and in the latter animal produced a pneumonic infection similar to that of the disease in man. The clinical picture so established served as basis for the recognition of the character of pneumonia due to virus infection.

The studies of Shope[35] with swine influenza resulted in the demonstration that this epidemic disease of hogs, which bears many comparisons with epidemic influenza of man, was caused by a filterable virus in symbiosis with a bacterium of the H. influenzæ variety. In this disease, the virus constitutes the important agent in dissemination and immunity while the H. influenzæ suis contributes the factor which makes the experimental disease comparable in severity to that seen in nature.

Dochez,[7] Long[23] and their associates were able to show that bacteria-free filtrates of washings from patients with typical common colds were capable of inducing common colds in the higher apes and in normal subjects. While the infection could not be transmitted to smaller laboratory animals, the evidence seems clearly to relate the common cold, etiologically, to a filterable virus.

In this state of development it was inevitable that attempts be made to restudy that confused complex of epidemic respiratory diseases vaguely termed colds, grippe and influenza. An opening was finally made when Smith, Andrewes and Laidlaw[36] reported, in 1933, that they had infected ferrets with a virus present in bacteria-free filtrates from throat washings of patients with influenza. The following year we confirmed this observation with material from epidemics in Puerto Rico, the United States and Alaska[13,14]. Since that time the virus has been repeatedly isolated in all parts of the world, always from cases associated with an epidemic of influenza. Instead of a simple febrile infection, involving only the nasal passages in ferrets, we found that with serial passages the virus developed the capacity to produce an extensive, sometimes fatal, pneumonia. Both in our laboratory and in England[1] it was found that mice were also susceptible and in this species of animal as well the virus had a primary predilection for the pulmonary tissues resulting in an experimental pulmonary disease of high fatality. Many other species of animals have been tested and, except for possibly the rat and hedgehog, found not to be susceptible; nor is there evidence to suggest that bacteria play any rôle whatever. Striking evidence of the specificity of the virus for the pulmonary tract is shown by the fact that it produces typical infection only by the intranasal route. When given by other routes the animals become immune without experiencing disease. When infected animals recover, they are immune to reinfection, and in their sera antibodies capable of neutralizing the virus and protecting normal animals are demonstrable.

But what evidence is there that the virus so isolated bears any relation to the human disease and that it is not merely a spontaneous infection of ferrets? First of all we have succeeded in infecting mice directly with the throat washings of patients without intermediate passage of the virus through ferrets.[15] It has also been possible to introduce the virus directly into tissue culture medium and onto the chorio-allantoic membrane of the egg without any previous animal passage.[16] These observations tend to eliminate the factor of animal contamination. In addition, we are able to demonstrate that a high titer of antibodies develops in the serum of patients convalescent from the epidemic disease[17,18]—in contrast to the results obtained with serum of the same patients taken in the acute stage. These antibodies can be demonstrated by means of the neutralization test in mice and by the much simpler procedure of complement-fixation. The close correlation of these serological reactions with illness from which influenza virus can be recovered has served to establish them as valuable criteria which can be used for diagnosis of epidemic influenza without the necessity at the same time of demonstrating virus in each individual case.

The virus has been found to infect human subjects both by laboratory accident[13,37] and by the intentional experiments of Smorodintseff and his Russian associates.[38] Finally, by subcutaneous inoculation of the virus grown in tissue culture medium, it is possible to induce the production of specific antibodies in human subjects without eliciting evidence of infection.[25] The rise in antibodies is similar to that which occurs in patients who have actually gone through infection with epidemic influenza.

The evidence seems conclusively, therefore, to identify a filterable virus as the etiological agent of epidemic influenza. Further support for the specificity of the agent is shown by the fact that hemolytic streptococcus tonsillitis, lobar pneumonia, low grade infections occurring at the same time as an influenza epidemic do not yield similar results.[18] This is also true of the afebrile common cold with its typical running nose. In addition, other epidemics of somewhat similar characteristics have been shown by these same procedures not to be epidemic influenza but etiologically different diseases.[14]

The studies have thus resulted in the recognition of a disease entity, epidemic influenza, caused by a specific filterable virus. They have established diagnostic methods which will serve for the clinical definition of the disease and have also established a basis of reference for differentiation of other diseases in this maze of respiratory infections.

Encephalitis and Meningitis

Another important group of diseases which has been more clearly elucidated as a result of recent virus studies is that comprising epidemic encephalitis and the so-called sterile or benign meningitis. While it is generally considered to be of virus origin, no convincing demonstration of virus has yet been adduced to prove that encephalitis lethargica—Von Economo—is caused by a filterable virus. Since there have been no significant outbreaks of this disease in recent years, further efforts along that line have not been possible. There have been, however, definite epidemics of acute meningo-encephalitis and instances of other acute nervous diseases which have been subjected to investigation with the result that the etiology has been clearly shown and definite features of diagnostic clinical value have consequently been recognized.

The first of these was an outbreak of acute encephalitis in St. Louis and its environs in the late summer of 1933.[22,23,28,29] Something over 1,000 cases occurred in a population of approximately one million with a mortality rate of 20 per cent. It was of interest that 89 per cent of the fatalities occurred in patients over the age of forty, although this age group constituted only a little more than half the cases. The onset was sudden in 57 per cent of cases and in 42 per cent there was a prodromal period of aching and malaise for a few days. With the onset of fever, the character of the disease was much the same in both instances. There appeared rapidly headache, high fever, vomiting, somnolence and stupor usually without true coma. Mental confusion was common, tremors of the tongue and lips frequent and nuchal rigidity occurred in 86 per cent of cases. In some instances irritative phenomena appeared instead of somnolence. Ocular symptoms were rare. Difficulties of speech or aphasia were present in about 12 per cent. Superficial and deep reflexes were diminished or absent but a positive Babinski was present in 40 per cent.

The spinal fluid was sometimes normal at onset but shortly developed a pleocytosis of 100 to 300 cells, predominantly mononuclear. In one case 1,100 cells were found. Sugar was not reduced and there was a slight increase in the protein content.

The course was stormy but short, lasting only three to five days in many instances. Recovery was prompt after the defervescence of the fever. Residual symptoms of significant degree were found in a small minority of the cases which were followed.

In fatal cases, an edematous, hemorrhagic pneumonia and degenerative renal changes together with inclusion bodies were so common that only 11 per cent of the fatalities were considered due to uncomplicated encephalitis. In the central nervous system, an intense congestion of the meninges and brain was seen with numerous petechial hemorrhages. There was perivascular round cell infiltration most marked in the pons and basal ganglia and, in addition, scattered foci of cells throughout the brain substance. Degeneration of nerve cells was widespread with most severe damage observed in the nerve cells of the midbrain and basal ganglia. The nuclei of the cranial nerves were not involved.

Suspensions of brain from fatal cases were inoculated into M. rhesus monkeys and induced, after an incubation period of eight to fourteen days, a mild, non-fatal infection with fever, muscular weakness, tremor, occasional paralysis, and excitement.[29] There was an increase in the number of cells in the spinal fluid to from 150 to 350. The pathology in sacrificed animals was similar to that seen in human cases. Attempts to transmit the disease with patient's blood, spinal fluid or nasal washings were unsuccessful.

It was then found that mice were also susceptible when inoculated by the intracerebral or intranasal routes.[41] After a quiet period of three to four days, these animals develop hyperesthesia, tremors, convulsions and prostration and die in five to nine days. Their brains reveal changes not unlike those of patients but with special damage to the pyramidal cells of Ammon's horn. Rabbits, guinea pigs and young sheep were not susceptible.

Finally, it was demonstrated that the sera of convalescent patients possessed antibodies capable of protecting mice against the virus while normal sera did not. This evidence was conclusive in establishing the relationship of the newly isolated virus to the epidemic of St. Louis encephalitis.

Since the studies with St. Louis encephalitis, another type of encephalitis occurring in Japan which presents similar epidemiological and clinical features has been shown to be caused by a filterable virus. This, the Japanese Type B encephalitis, was epidemic in Japan in 1924 and 1929. At the time of the St. Louis epidemic the similarities between it and the Japanese Type B —or summer encephalitis—were emphasized. The latter occurs at the same time of year, has the same general syptomatology which differs from that of encephalitis lethargica; is, in general, more highly fatal but retains the tendency to strike harder in the older age groups. While in their clinical and epidemiological features a great resemblance occurs, the viruses of the two diseases have been found to be different serologically in that serum of patients or animals recovered from infection with the St. Louis encephalitis strain does not protect animals from infection with the other, and vice versa.[42] Moreover, the Japanese strains induce a fatal infection in monkeys and in young sheep. In these characteristics and in its pathology the disease more nearly resembles louping ill.

Equine Encephalomyelitis

In the past year interest has been focused upon another epidemic of encephalitis which possesses characteristics similar to those of the preceding types. Late in August and September of last year southeastern Massachusetts was experiencing a rather high incidence of encephalitis in horses. At the same time cases of human encephalitis occurred in the same area. Forty-six cases of the disease were observed clinically, among which thirty-three deaths occurred. Interestingly, thirty-two of the cases and twenty-one deaths occurred in children under ten years of age. In fact, half the cases occurred in children under five years of age. From the brain tissue of fatal cases a virus was isolated by mouse inoculation.[12,43]

The virus was found to produce a fatal nonbacterial infection in rabbits, guinea pigs, young sheep and M. rhesus monkeys;[43] in the latter species virus was present in the blood and spinal fluid. The virus was identified as the eastern type of equine encephalomyelitis by means of neutralization tests with known immune serum. Its identity was further confirmed by direct inoculation of horses which were known to be immune or susceptible to the eastern type of virus.[33] That this virus was the actual cause of the human epidemic was established by the demonstration that the serum of recovered patients possessed the capacity to neutralize the virus, a capacity not present in serum taken from the same patients early in the disease.[43]

While the number of cases was small, rather accurate clinical descriptions are available.[10,44] It must be borne in mind, however, that they probably represent the most easily detected cases and that further studies will modify the impressions gained. The onset of the disease in infants, comprising the majority of observed cases, was sudden, with high fever, irritability or stupor, cyanosis and convulsions. In older children and adults the onset was gradual over four to ten days. Rigidity of the neck and continued muscular tremors and twitchings were uniformly present. All patients became comatose or semicomatose and were not easily aroused. Abnormal ocular findings except for nystagmus were uncommon. Paralysis and muscle spasms were common. Deep and superficial reflexes were usually absent, while Kernig and Babinski were variable. Cyanosis is said to have been marked in all cases. In infants a peculiar edema developed about the eyes. There was ordinarily a high leukocytosis, preponderantly polymorphonuclear. The spinal fluid was under increased pressure, with a marked outpouring of cells (ranging from 200 to 2,000) of which 60 to 90 per cent were polynuclear, at least in the acute stage of disease. Protein was high. Sugar content was normal. If patients survived, the number of cells decreased and more mononuclears appeared. Following the acute stage improvement was slow, with coma and muscular rigidity lasting for days and it appears likely that permanent residuals will be seen.

In fatal cases, deep coma from which the patient never aroused developed and death occurred in four to five days. Pathologically, marked edema and hyperemia of brain stem and upper cord were observed, most marked about the base. Perivascular cuffing with polymorphonuclear and large mononuclear cells was widely distributed and meningeal infiltration with the same types of cells was present. Numerous foci of nerve cell destruction and parenchymatous cellular infiltration were present. The pons, medulla and basal ganglia were most severely affected and at times the nuclei of cranial nerves and Purkinje cells of the cerebellum were damaged.

We have here, then, a minor epidemic which in seasonal occurrence conforms to that of the St. Louis epidemic and in symptomatology differs primarily in the severity of the disease as measured by the course of disease, the mortality rate and the more intense pathological changes. These changes do not, however, exceed those reported in the Japanese B encephalitis. One sharp difference appears: the Massachusetts outbreak occurred primarily in infants and young children, whereas the others were most serious in the older age groups. But for the virus studies it seems certain that classification of the Massachusetts disease would have been difficult. Knowing the etiology, however, certain differences may be more clearly evaluated.

That encephalomyelitis of horses should also occur as a serious human disease did not come as a total surprise. Meyer[26] in 1932 suggested the possibility in three human cases of encephalitis closely associated with sick horses. In 1937, Eklund and Blumstein,[8] on epidemiological grounds, suspected its occurrence in human individuals and the suspicions were confirmed by serological tests. The virus has been shown to be transmissible by several species of ubiquitous mosquitoes, to occur spontaneously in pigeons[11] and pheasants[40] synchronously with an equine and human epidemic. The application of the technics above outlined for the diagnosis of virus diseases has sharply differentiated by the methods of isolation and identification a new entity in the realm of human diseases.

I should like to mention cursorily one other disease brought to light in the period of time which includes all these other studies—lymphocytic choriomeningitis. The name is probably a misnomer. The virus was first recovered from a monkey inoculated with human brain material during studies of the St. Louis epidemic conducted by Armstrong and Lillie in 1934.[2] It was then described by Traub in 1935[39] as occurring spontaneously in mice, where it maintained itself throughout a colony in a state of perfect parasitism with its host. Finally, Rivers and Scott[32,34] isolated the virus from human individuals who suffered from a non-bacterial

TABLE I. DIFFERENTIAL FEATURES OF ACUTE NERVOUS INFECTIONS

	St. Louis Encephalitis	Equine Encephalomyelitis	Lymphocytic Choriomeningitis
Season	Late Summer	Late Summer	Not Seasonal
Age Preference	Over 40 years	Under 10 years	More in adults
Mortality	20%	60% (?)	Low
Major Signs	Meningo-encephalitic	Meningo-encephalitic	Meningeal
Mental State	Somnolence	Coma	Irritation
Stiff Neck	Uniform	Uniform	Common
Tremors	About mouth	Diffuse	Mild, if any
Paralyses	Infrequent	Common	Rare
Reflexes	Absent	Absent	Exaggerated
Eye Signs	Rare	Rare	Rare
Spinal Fluid Cells	100-300 monos	200-2000 polys	Avg. 500+, monos
Course	Short—prompt recovery	Short—delayed recovery	Longer—slow recovery
Complications	Pneumonia, nephritis	Few	Sensory disturbances
Residua	Mild	Probably severe	Mild and infrequent
Pathology	Brain, esp. basal ganglia hyperemia infiltration—mono nerve cell degeneration Inclusions in kidney	Same but more marked also meningitis hyperemia and edema infiltration—poly nerve cell degeneration	Meningitis-choroiditis—mono Inclusions in choroid (?)
Virus Present in	Brain	Brain, sp. fluid	Spinal fluid, blood—probably brain
Size of Virus	20-40 mu	20-40 mu	30-50 mu
Disease in Mice	Inc. 4-5 days Death 5-9 days	Inc. 1-2 days Death 2-4 days	Inc. 5-6 days Death 6-7 days
Disease in M. rhesus	Very mild—i.c.	Fatal—i.c.	Fatal—by all routes
Spontaneous Disease in Other Species	Not known	Horse Pigeon Pheasant	Mice Monkeys

lymphocytic meningitis and a total of some twenty-five cases[4] has been reported. The disease has not been observed in epidemic form but that it is widespread is shown by the fact that antibodies against the virus are found in the serum of 11 per cent of the general population.[3] It is impossible on clinical grounds alone to differentiate the disease. A history of grippy illness frequently precedes the onset of meningeal signs. There are, ordinarily, fever, headache, vomiting, stiffness of neck, positive Kernig and Babinski. Hyperesthesias and segmental reactions may be observed. The patients are not usually as sick as in bacterial meningitis or in the encephalitic illnesses we have discussed. The spinal fluid is under increased pressure, protein is increased, and the number of cells, almost entirely lymphocytes, is usually over 500 per cu. mm.

The virus infects mice, guinea pigs and monkeys, producing a mononuclear meningitis, usually with an incubation period of 6 to 7 days. The pathology is almost entirely limited to the meninges and the ependyma of the choroid plexus, without encephalitis. This serves clearly to differentiate it from the viruses previously mentioned.

While the virus of lymphocytic choriomeningitis does not account for all cases of acute aseptic meningitis, the disease with which it is associated can now be sharply marked off by the character of the etiological agent.

Summary

I have attempted to place before you a brief outline of the technics followed in the isolation and identification of a filterable virus from human patients and to show how the correlation between a virus and a disease is brought about. Somewhat arbitrarily and perhaps too sketchily I have tried to show that these procedures in the past six years have resulted in great advances in the study of respiratory and nervous diseases. They have succeeded in delimiting, from indefinite nosographic or vague clinical groups, definite etiological entities, with which evidence the construction of clear clinical criteria may develop and in the end eliminate some of the more tedious experimental studies.

It may seem that too much of the diagnosis of virus diseases is made in retrospect as a result of prolonged and detailed laboratory studies. This is inevitable. It has been equally true of bacterial infections until practical short-cuts of diagnostic value have been devised. It is important to realize that the advances come slowly but do come. As in influenza, the complement-fixation test has been found to yield evidence equal in value to that derived from the much longer and much more expensive neutralization test in mice, so other methods applicable to diagnosis early in the disease will be discovered. Differential diagnosis of the various etiological agents requires a charting of many characteristics. Differential diagnosis of the diseases caused by them must rest on clinical epidemiology in which clinical features are viewed in the light of established etiology.

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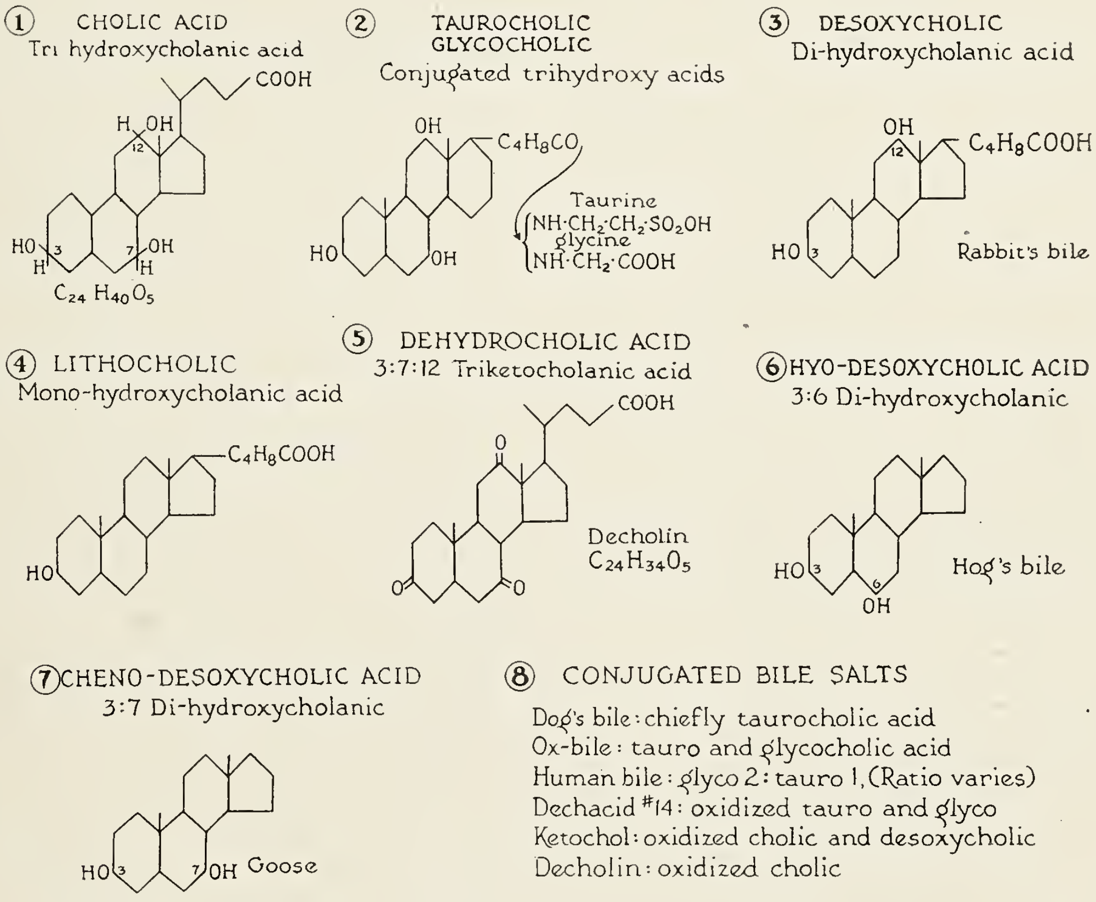
THE RATIONALE OF BILE SALT THERAPY IN BILIARY TRACT DISEASE*

A. C. IVY, Ph.D., M.D., and A. L. BERMAN, M.S.†
Chicago, Illinois

THE rational therapeutic use of bile salts depends on an understanding of their functions and activities in the economy of the body. Thus, it is appropriate to list their known functions and activities.

1. The bile salts promote the formation of bile. They increase the volume output and the total cholesterol output, but do not materially affect the pigment output in a normal animal. Whether bile salts will increase pigment output when there is some retention of pigment due to excessive hemolysis or hepatitis has not been satisfactorily demonstrated. When *natural bile salts,* that is, the bile salts made by the liver of a normal animal, are given enterally, the bile salt is absorbed and all but about 10 per cent is reëxcreted in the bile. Where the 10 per cent loss occurs is unknown.


① CHOLIC ACID
Tri hydroxycholanic acid
COOH
H OH
12
HO 3
H
7 OH
H
$C_{24}H_{40}O_5$
② TAUROCHOLIC
GLYCOCHOLIC
Conjugated trihydroxy acids
OH
C_4H_8CO
Taurine
$NH{\cdot}CH_2{\cdot}CH_2{\cdot}SO_2OH$
glycine
$NH{\cdot}CH_2{\cdot}COOH$
HO
OH
③ DESOXYCHOLIC
Di-hydroxycholanic acid
OH
12
C_4H_8COOH
HO 3
Rabbit's bile
④ LITHOCHOLIC
Mono-hydroxycholanic acid
C_4H_8COOH
HO
⑤ DEHYDROCHOLIC ACID
3:7:12 Triketocholanic acid
COOH
O
Decholin
$C_{24}H_{34}O_5$
O
O
⑥ HYO-DESOXYCHOLIC ACID
3:6 Di-hydroxycholanic
HO 3
6
OH
Hog's bile
⑦ CHENO-DESOXYCHOLIC ACID
3:7 Di-hydroxycholanic
HO 3
7 OH
Goose
⑧ CONJUGATED BILE SALTS

Dog's bile: chiefly taurocholic acid
Ox-bile: tauro and glycocholic acid
Human bile: glyco 2: tauro 1, (Ratio varies)
Dechacid #14: oxidized tauro and glyco
Ketochol: oxidized cholic and desoxycholic
Decholin: oxidized cholic

Fig. 1.

Natural bile salts "thin" the bile chiefly by decreasing its viscosity and not by decreasing its content of total solids per c.c.

2. Bile salts by keeping fatty acids in solution at the acid reaction of gallbladder bile prevent the precipitation of cholesterol and fatty acids in the gallbladder.[40,41]

3. The natural bile salts aid in the digestion and absorption of fats. They facilitate the action of lipase and some believe of amylopsin and trypsin. Dehydrocholic acid (Fig. 1) is said not to facilitate the action of lipase like most other bile acids. Animals like the cat, dog and man, which possess a liver which forms relatively small quantities of bile, have a gallbladder which concentrates and stores hepatic bile apparently for digestive purposes.

4. Natural bile salts facilitate the absorption of iron and calcium and are necessary for the absorption of carotene, the precursor of vitamin A, and for the absorption of vitamins D, E,

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†From the Department of Physiology and Pharmacology, Northwestern University Medical School, Chicago.

and K.[12,13,14,15,42,43] The evidence indicates that desoxycholic acid, not tauro or glychocholic acid or dehydrocholic acid, is responsible for the absorption of carotene.[12,13,14,15] We have no such clear-cut information regarding vitamins D, E and K, although various bile-salt preparations are reported to promote the absorption of vitamins D and K.[6,26] Desoxycholic acid is present in the bile of man, and to a more or less extent in the bile of other animals.[7,8,35]. Desoxycholic acid is now available commercially (degalol) and has been used clinically to promote the absorption of vitamin K. Desoxycholic acid is present in ox-bile salts, which contain usually from 10 to 20 per cent.[30] Bile salts facilitate the absorption of sterols, such as cholesterol.

5. Bile salts given orally have a laxative action. They stimulate intestinal motility. The dose required for laxation varies. It depends, in normal dogs, on the amount of bile salts being manufactured by the liver. The greater the bile salt excreted and passed into the intestine, the less the bile salt required orally to elicit diarrhea. Of course, in the human patient, the diet and the sensitivity of the colon are additional factors affecting the dose required for laxation. When bile salts provoke diarrhea, then bile salts may be found in the stools.[33] Along with dietary factors, bile salts are natural laxatives, in our opinion.

6. Bile salts are said to play an important rôle in detoxifying bacterial toxins in the intestinal tract.[20] Bile salts are anti-putrefactive and inhibit B. coli, but are not general antiseptics[21,35]

7. Some evidence indicates that, when bile salts are being secreted, liver glycogen is diminished.[32,34] Several observers claim that bile salts increase glycogen deposition.[23,25,44] None of the evidence on this point is complete or satisfactory.

8. Although bile salts increase the cholesterol output, the increase in bile acids in the bile is much greater than the increase in cholesterol. Thus bile salts orally can favorably influence the bile-salt-cholesterol ratio, if the liver is normal or is secreting bile salts.[22,23]

When an obstruction of the bile duct is relieved, the first bile obtained usually contains pigment, if the hepatitis is not severe, but it contains no bile salts.[22] The liver secretes pigment when it does not secrete bile salts. Bile salts may not appear in the bile until five or more days postoperatively.[22,28] The bile obtained postoperatively is frequently in practice returned to the patient. When this is done very little or no cholic acid is returned to the patient. When it is desirable to give such postoperative patients bile salts, one should give the patient desiccated animal bile or some preparation of bile salt. Whether the administration of bile salt increases the excretion of pigment or favors the recovery from hepatitis and regeneration of the liver has not been established. In fact, bile salts may be given to some patients after the relief of obstruction and none may be observed to be excreted in the bile. What happens to the bile salt given is unknown. Thus, when one gives bile salts to a patient with obstruction or early after the relief of an obstruction, the bile salt can only operate, so far as present evidence permits a definite statement, by improving the activities of the alimentary tract.

The Choice of Bile Salts for Therapy

The physician well knows that many preparations of bile and bile salts are available, such as dried whole ox or hog's bile, the natural ox-bile salts with and without iron, and the oxidized bile salts. Tablets are also available which contain relatively little bile salt in contrast to the cathartic drug they contain; in fact they contain so little bile salt that the little present might as well be omitted.

Most of our work to date has involved a study of the metabolism of the unoxidized conjugated (sodium taurocholate and sodium glycocholate) natural bile salts and the oxidized unconjugated ("decholin" and "ketochol") and oxidized conjugated (Wilson Laboratories, dechacid) bile salts and acids in bile fistula dogs. (It should be added that this is not a simple subject because the biliary fistula method is a difficult one and because our knowledge of the complex subject of the chemistry of bile and the bile acids and their metabolism is meager.)

The oxidized bile salts, such as "decholin" and "ketochol," when given intravenously are less toxic than the natural unoxidized bile salts. "Decholin," or sodium dehydrocholate, because of its purity, is probably the best bile salt now available for intravenous use. Since bile salts are so readily absorbed from the intestine, there is no indication for intravenous therapy other than perhaps to obtain a "priming" effect on the liver.

It has been argued that the salts of oxidized bile acids are preferable to the unoxidized bile acids for oral therapy because the oxidized bile acids show less systemic toxicity, and hence tend to cause less hemolysis in the portal blood and less injury to the liver. This contention, although non-teleological, may be true in part, but it has not been established by in vivo experimentation.

In regard to the effect of the intestinal absorption of various bile salts on the erythrocytes in the portal blood, it has not been shown that the erythrocytes are more "fragile" when unoxidized salts are being absorbed than when oxidized salts are being absorbed in equivalent amounts. Neither has it been shown that more bile pigment is excreted in the bile when unoxidized bile salts are given than when oxidized bile salts are given. Our results show that when 3 or 5 grams of ox-bile salts are given orally, 112 mgm. (average of twenty-five dogs) of pigment are excreted daily; and when 3 grams of "ketochol" or "decholin" are given, 113 mgm. of pigment are excreted by the normal dog on a controlled diet. If the absorbed bile salt injured the red cells differentially, the pigment outputs observed should not have been the same.

In regard to the effect of oxidized and unoxidized bile salts on the liver, we have found that neither 3 nor 5 grams of unoxidized oxbile or dog's bile salts depress natural cholic acid synthesis. Three grams of oxidized bile salt, as decholin or ketochol, do not significantly depress natural cholic acid synthesis; but 5 grams may occasionally depress natural cholic acid synthesis. This depression of natural cholic acid synthesis by oxidized bile salts raises the question of their toxic action on the liver because natural bile salt synthesis is depressed by toxic and infectious hepatitis as well as by obstruction. However, it is possible that the depression is due to some factor other than toxicity—for example, simple replacement. To test this possibility we have fed normal dogs 3 grams of oxidized bile salt (decholin and ketochol) daily for several months. During this period the liver function was tested by the bromsulphthalein clearance test. When the period was terminated, the liver was assayed for glycogen and fat. No change from normal was observed. We are now repeating the experiments with 5 grams of oxidized bile salt. Of course, this dose of bile salt, 75 grains daily, is relatively much larger than any dose that might be used in human therapy. But, we are interested in the question from an academic as well as a practical viewpoint, and it is possible that a diseased liver may be more sensitive to a bile salt that depresses cholate synthesis than a normal liver. On the contrary, an oxidized bile salt with low systemic toxicity may be preferable.

The selection of a bile salt for therapeutic purpose is not as simple as it might appear to be from a superficial examination. Other effects of the bile salt than its systemic toxicity and ability to increase the volume output of bile (hydrocholeresis) should be considered. The following physiological analysis includes the more important points that require consideration and investigation before one can say that one preparation is superior to another for a general or a particular therapeutic indication.

Points to be considered in the selection of a bile salt or acid for therapeutic purposes:

1. The effect of long continued amounts on the liver.
2. The effect on the composition of the bile.
    a. Fluidity and total volume output of bile.
    b. Bile salt content.
        (1) Natural bile salt content.
        (2) Bile salt content most favorable for the solution of cholesterol and fatty acids.
        (3) Bile salt content least favorable for absorption by gallbladder mucosa.
        (4) Bile salt content most favorable for intestinal absorption.
        (5) Bile salt content as related to laxation.
    c. Cholesterol output in bile.
    d. Pigment output.
    e. Fatty acid output.
3. General toxicity.
4. Gastro-intestinal irritation, including absorbability of the bile salt and laxative action.
5. The effect of the bile salt on the absorption of fat and vitamins and minerals.

As stated above, if one believes that the patient should receive bile-salt therapy intravenously, then a pure preparation of low systemic toxicity should be used. For oral use, the question of toxicity does not have to be so seriously considered, though the matter of gastric and intestinal irritation may be worthy of consideration. Whether one should select a preparation of dried, whole bile or a preparation of bile salts cannot be answered categorically at present. However, according to existing knowledge, the only active ingredient in bile is the bile acids. Dried, whole bile will contain presumably all the natural bile acids, whereas a bile salt preparation may not, since bile salt preparations may vary widely depending on how they are made and on their source. The hydrocholeretic effect of the bile preparation will depend on its bile salt content and its content of the various types of bile acids. A sufficient amount of comparative evidence does not exist at present for us to state which preparations are better for oral therapy. When hydrocholeresis is the sole desideratum, the salts of the oxidized bile acids, decholin and ketochol, per gram weight are preferable, according to our extended observations on the dog. If one desires to increase the elimination in the bile of the natural bile salts, then some preparation of natural bile salts should be used.

Indications

In the absence of bile salts in the intestine the oral administration of bile salts is indicated to improve digestion and absorption.—The rôle that bile salts play in the absorption of vitamins D and K and fats are alone sufficient indications. In this connection, it should be pointed out that the presence of bile pigment in the feces does not necessarily indicate that bile salt is being secreted in the bile. The liver may excrete pigment when it does not form and secrete bile salts. Frequently in biliary tract disease, in the absence of total obstruction, sufficient hepatitis may be present to prevent and markedly diminish bile salt synthesis but not to prevent bile pigment excretion. Thus, bile salt deficiency in digestion may occur in the presence of pigmented feces.

The question of the possible harmfulness of giving bile salts when the common duct is obstructed or when hepatitis is present deserves consideration. This question, to our knowledge, has not been adequately investigated. Several years ago we obstructed the common duct of eight dogs and gave bile to four of them and not to the other four. No significant difference in the postoperative length of life of the two groups was observed. This is too small a series, however, on which to base a conclusion. Of course, bile salts have now been given orally for a short period of time to many jaundiced patients without evident harm.

In biliary tract disease, without acute hepatitis, bile salts are administered to flush the biliary passages with a copious flow of low viscosity.—In other words, bile salts may be used *with the hope* of counteracting a tendency toward stasis and its effects. At least, the administration of bile salts is the only known way of producing and maintaining a copious flow of bile through the biliary passages. To obtain this effect, however, the patient must have a liver that will secrete bile salts.

Flushing of the bile ducts.—A brisk flow of fluid through the hepatic ducts would tend to prevent ascending infection. In our work with biliary fistula dogs we have found that ascending infection, cholangeitis and hepatitis, rarely occurs as long as the animal receives bile salts or its own bile. If cholangeitis did occur, sediment and concrements would be less likely to collect on the inflamed mucosa of the ducts. Also, bile of low viscosity would have less difficulty passing through an hypertonic sphincter of Oddi than viscous bile. Goldman and Ivy[11] have found recently that a liver secreting copiously in response to bile salts is difficult to inhibit reflexly by distention of the colon or stimulation of the mesenteric nerves. They found further that distention of the colon or stimulation of the colonic nerve would cause a contraction of the sphincter of Oddi. Thus, abnormal activity of the colon tends to cause stasis on two counts: (1) a decrease in bile formation or the formation of more viscous bile; and (2) an increase in the resistance offered by the sphincter. Since bile salts are laxative, a lack of bile salts would increase the tendency toward constipation and the increase in constipation would further affect the liver and sphincter, thus possibly setting up a vicious circle that is broken best by the oral administration of bile salts.

Flushing of the gallbladder.—To what extent the administration of bile salts will change the chemistry of the bile in the gallbladder and will flush out the gallbladder is uncertain. This question is of obvious practical importance.

In the latter part of pregnancy, Gerdes and Boyden[10] have shown that the gallbladder evacuates more slowly than normal. Potter[27] and Riegel, Ravdin and others[29,31] have found that the bile in the gallbladder of pregnant women near term tends to be high in cholesterol and low in bile acid. It is believed that in gallbladder stasis, bile acid tends to diffuse out of the bile into the blood. This obviously would favor precipitation of cholesterol and production of a viscid bile. Whether the administration of bile salt would counteract this change in the chemistry of bile, though likely, is undetermined.

Neither has it been shown that the administration of bile salts will tend to flush out the gallbladder.—It is possible that "flushing" or a "washing out" of the gallbladder might be obtained by giving bile salts and then fat to empty the gallbladder, and then repeating the procedure three or four times daily. In support of this possibility several pertinent observations may be cited. A number of observers have reported that the administration of bile salts increases the cholecystographic image of the gallbladder and also increases the rate of visualization.[1,2,4,9,16,17,18,19,24,26,38,39] This indicates that when bile is being formed copiously some of the bile actually enters the gallbladder as might be expected. Jenkinson[19] has reported that by giving bile salts and a diet relatively rich in fat, he obtained normal gallbladder pictures in eight patients who previously had non-filling gallbladders. More convincing evidence has been provided by Bech and others.[3] Using dogs, they found that bile salts given orally during a period of eleven or more days caused a decrease in the total solids and the acidity of the gallbladder bile. Such changes indicate the occurrence of a sort of flushing action in that the gallbladder bile was thinner and its reaction was made more like that of hepatic bile. Hepatic bile is alkaline; gallbladder bile is, normally, slightly acid. However, it must be remembered that if the gallbladder does not fill in acute or chronic cholecystitis then a copious flow of bile would only accomplish a flushing of the bile ducts.

In the presence of biliary tract disease and acute hepatitis the use of bile salts is implied to be of benefit by a number of clinical observers, especially after the relief of a common duct obstruction. Until more unequivocal observations become available, we shall continue to doubt the wisdom of bile salt therapy in such a condition except for the purpose of improving intestinal absorption.

It must not be forgotten that the administration of bile salts except in the presence of acholic stools is an allopathic procedure. It is only an etiologic or a scientifically directed procedure when it can be shown by direct laboratory tests that the liver and biliary tract of the patient are functioning abnormally and bile-salt substitution or addition therapy is necessary and will correct the disturbance.

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THE SCOPE OF SURGERY IN THE CONTROL OF PULMONARY TUBERCULOSIS*

HERBERT A. CARLSON, M.D.
Ah-Gwah-Ching, Minnesota

THE scope of collapse therapy for pulmonary tuberculosis has been broadened in recent years, partly by the development of new or improved technics, but largely by a more aggressive use of methods which, for the most part, are not new. In some institutions the indications have been extended to a point where more than three-fourths of the patients receive the benefits of one or more of the several means now available for resting, relaxing or collapsing the lung.

There are, undoubtedly, limits beyond which a reasonable program of collapse therapy cannot be extended. In one group of patients surgery may be unnecessary; in another, futile or meddlesome; and as the composition of tuberculous populations may vary in different sanatoria as to stage, pathological characteristics and constitutional reactions, the scope of collapse therapy in different institutions likewise will vary.

Furthermore, there are legitimate differences of opinion regarding the indications for the various procedures. Alexander, for example, employs a variety of operations beginning with the simplest that has a reasonable chance of controlling the disease and resorting to the more radical procedures as required. He employs active therapy for both exudative and productive tuberculosis, whether cavities are present or not. Coryllos, on the other hand, regarded the presence of cavitation as the sole indication for surgery.

Admissions to Minnesota State Sanatorium

The present study was undertaken to evaluate the rôle of collapse measures in the management of patients at the Minnesota State Sanatorium, an institution devoted to the care of tuberculous patients who come chiefly from agricultural communities and the smaller cities of Minnesota. For this purpose the records and x-rays of all patients admitted during 1938 were reviewed. It is realized that not sufficient time has, as yet, elapsed for a final evaluation of end-results, but sufficient information has been obtained to justify a preliminary report on clinical experience with a variety of surgical procedures.*

In 1938 there were 291 new patients admitted to the Minnesota State Sanatorium, eighty-six of whom were Indians. As the tuberculous Indians

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*The data were collected as of April 1, 1939.

TABLE I. THERAPY OF 172 PATIENTS WITH ACTIVE PULMONARY TUBERCULOSIS

	Number of Patients				Percentage
1. No collapse therapy	79				46
2. Unsuccessful pneumothorax (only)	10*			93	54
3. Unilateral pneumothorax	28	Successful induction of pneumothorax 51†			
4. Bilateral pneumothorax	1				
5. Intrapleural pneumonolysis	11				
6. Pneumothorax—Oleothorax (one contralateral pneumothorax)	3				
7. Pneumothorax—Phreniphraxis (one contralateral)	8		Phrenic Nerve Operations 34		
8. Phrenic Nerve Operation	23				
9. Phreniphraxis—Pneumoperitoneum	3				
10. Pneumoperitoneum	3				
11. Thoracoplasty	3				

*Unsuccessful induction of pneumothorax totalled 23 in 21 patients (30%)
†Successful induction of pneumothorax totalled 53 in 51 patients (70%)

present problems quite different from those of their white contemporaries, they are excluded from consideration at this time. Among the 205 white patients, thirty-three did not have active pulmonary tuberculosis and were classified as follows: non-tuberculous thirteen, first infection three, inactive eight, extra-pulmonary tuberculosis nine. The therapy of the 172 white patients who had active pulmonary tuberculosis has been tabulated (Table I).

No Collapse Therapy

No form of collapse therapy was given to a group of seventy-nine patients, or 46 per cent of those with active pulmonary tuberculosis (Table I). Among these were six patients with negative sputum who did not appear to be in need of collapse therapy, two senile patients and sixty-one patients for whom collapse therapy appeared to be definitely contraindicated because of extensive bilateral disease, miliary tuberculosis, renal tuberculosis, peritonitis, enteritis or meningitis. The latter group consisted almost exclusively of patients classified as pre-terminal.

On the other hand there were five patients for whom some form of collapse therapy had been recommended (four refused) and five patients who might possibly benefit by such treatment (four were transferred or left against advice).

Thirty-five patients who had no collapse are already dead, three to fifteen months after admission, a mortality of 44 per cent as contrasted with a mortality of 6.4 per cent in the group selected for collapse therapy.

Pneumothorax

The ninety-three patients (54 per cent) for whom some form of collapse was attempted (Table I) includes ten cases of unsuccessful pneumothorax, two of which were bilateral. Pneumothorax was judged unsuccessful when it could not be induced or when it was discontinued after a few refills. Unsuccessful induction of pneumothorax, however, also occurred among patients who later had other procedures. Altogether, unsuccessful induction of pneumothorax (unilateral and bilateral) occurred twenty-three times in twenty-one patients. Successful induction occurred fifty-three times in fifty-one patients. Penumothorax, therefore, was successful in only 70 per cent of the attempts.

The term "successful" as applied to pneumothorax, however, is a misnomer as in only twelve (22 per cent) could the collapse be referred to as good or excellent. In fifteen (28.3 per cent) restraining adhesions may or may not compromise the clinical result, eleven (20.7 per cent) have already required pneumonolysis. In 7 (13 per cent) supplementary phreniphraxis has been performed, three (5.7 per cent) have been converted to oleothorax, and in five (9.4 per cent) collapse appears to be inadequate and abandonment of pneumothorax should be considered.

Despite the handicap of restraining adhesions and the need of supplementary operations, pneumothorax is still a most effective weapon in the control of tuberculosis. About one-half of the patients carrying pneumothorax already have negative sputum* and apparent closure of cavities. Others have not been observed long enough to justify even a preliminary evaluation of results.

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*The sputum status of patients in this series can be reported only tentatively, although some have had guinea pig inoculations.

Intrapleural Pneumonolysis

Wherever pneumothorax is employed, a certain number (14.8 per cent, according to Anderson and Alexander) will be found who require pneumonolysis. Of our patients who had pneumothorax successfully induced in 1938, eleven (20.7 per cent) have already had this operation. Although care and discrimination are needed in selecting patients for pneumonolysis, the operation naturally follows the affirmative answer to two questions: Is division of adhesions necessary? Is the operation technically possible?

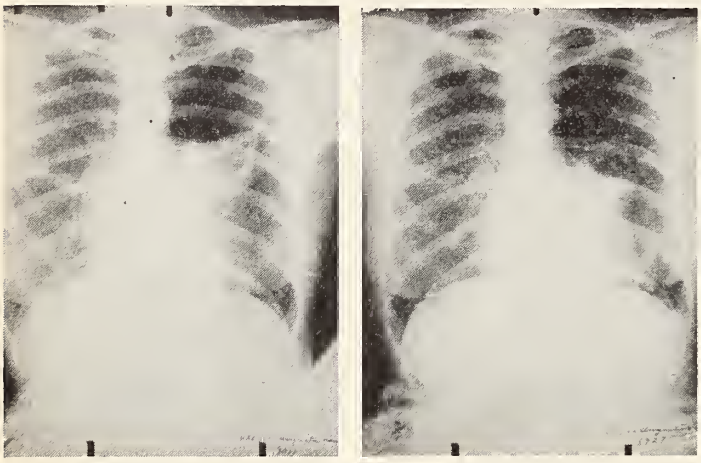

Fig. 1A Fig. 1B

Fig. 1. A—Roentgenograms taken November 22, 1938. Pneumothorax left, with suspended cavity in upper portion of lower lobe. B—Roentgenogram taken March 18, 1939. Cavity is closed following intrapleural pneumonolysis. No tubercle bacilli were found in sputum.

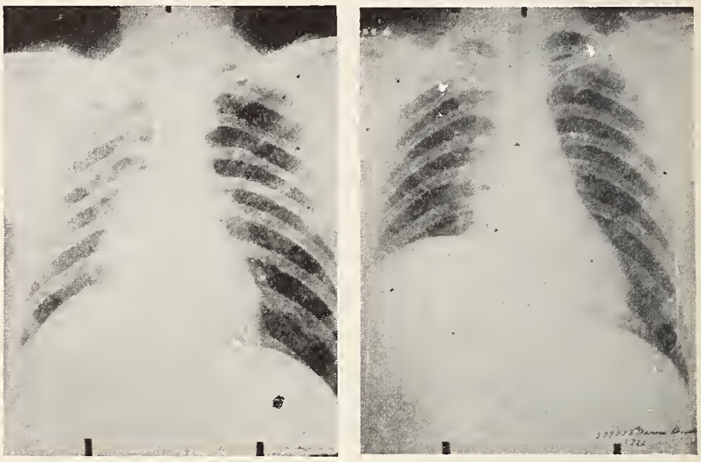

Fig. 2A Fig. 2B

Fig. 2. A—Roentgenogram taken February 16, 1938. Pulmonary tuberculosis (right) with cavity. Patient refused pneumothorax, accepted phreniphraxis. B—Roentgenogram taken February 15, 1939. Right diaphragm paralyzed; pulmonary disease much improved; cavity apparently closed; sputum, including guinea pig inoculation, gave negative findings.

Frequently the answer to the second of these questions is not made clear by x-ray examination. When doubt exists thoracoscopy is indicated. The operation was entirely successful technically in eight of the eleven cases reported here (Fig. 1, A and B); the other three were only partially successful as all restraining adhesions could not be divided. One patient who had a partially divided, short, thick adhesion remaining after an extensive cauterization of bands and cords, apparently has a satisfactory result as a consequence of stretching of the partly cauterized adhesion. At some future date this adhesion can be divided completely if necessary but at present the collapse appears to be adequate.

Seven of the eleven patients who have had pneumonolysis have negative sputum and closed cavities. In two cases the results are in doubt and two appear to be failures due to technical difficulties.

Oleothorax

Oleothorax occupies a limited but valuable field. Three of the pneumothorax patients have already had oleothorax. One was instituted because progressive adhesions threatened to obliterate the pleural space. The second was used to control a left tuberculous empyema in a patient who had bilateral pneumothorax. In this case the empyema appears to be cured, and the right pneumothorax has been abandoned. The third represented an attempt to treat a pyopneumothorax present on admission. In this case oleothorax has been abandoned and thoracoplasty recommended because of the demonstration of the presence of a bronchial fistula. All three of these patients have negative sputum.

Phrenic Nerve Operations

There has been a great deal of controversy regarding the value of phrenic nerve operations because different surgeons have employed phrenic nerve paralysis under circumstances that were entirely different. If one contends with Coryllos that the only purpose of collapse therapy is to close cavities, it must be admitted that operations on the phrenic nerve have a very restricted use. On the other hand, if one accepts the broader indications of Alexander, phreniphraxis becomes an important part of the management of tuberculosis.

Phreniphraxis was performed in the present series on thirty-four patients: as an independent procedure (on twenty-three patients), as a means of improving pneumothorax (on eight patients) and combined with pneumoperitoneum (on three patients). Phreniphraxis was considered to be the operation of choice when the disease was minimal or moderately advanced, chiefly unilateral, without cavitation or with small cavities (1-3 cm.). It was employed as a second choice when the disease was more extensive and larger cavities were present following unsuccessful attempts to induce pneumothorax. It was also used for hemoptysis, to increase the collapse of an incomplete pneumothorax when the lung was adherent to the diaphragm, in conjunction with pneumothorax for the contralateral lung in lieu of an unsuccessful attempt to induce bilateral pneumothorax and following abandonment of pneumothorax.

Nine of the twenty-three patients who had phreniphraxis as an independent procedure had negative sputum on admission. Some progression of the disease occurred in one of these; the condition is improved or stationary in the others. Fourteen had positive sputum on admission, six of whom are now negative. Nine had cavities varying in diameter from 2 to 8 cms. Three cavities measuring 2 to 5 cm. now appear to be closed. An interesting result was obtained in the case of a young man who refused pneumothorax but accepted phreniphraxis (Fig. 2, A and B). On the basis of these early data it appears that improvement occurred in at least one-half of the patients who had phreniphraxis alone.

Phreniphraxis supplementary to an inadequate pneumothorax was apparently successful in three of the eight instances in which this combination was used.

Pneumoperitoneum

Pneumoperitoneum was used in three instances to enhance the effect of a phreniphraxis. It was also employed in three cases of bilateral disease when pneumothorax was unsuccessful or contraindicated. Although improvement followed the use of pneumoperitoneum in one patient, no decisive results were observed.

Thoracoplasty

The small number of thoracoplasty patients among those admitted to the Sanatorium in 1938 (Table I) is due to the fact that they had been under observation only three to fifteen months when the data were collected and both patient and physician were reluctant to accept a major surgical procedure until simpler measures had been given a thorough trial. One patient in the group of unsuccessful pneumothoraces and one with empyema in whom oleothorax was abandoned are in need of thoracoplasty. Others who have had pneumothorax attempted unsuccessfully or who have inadequate pnueumothorax or who have failed to obtain the desired result from phreniphraxis will soon become candidates for thoracoplasty. Often because of bilateral disease, a long period of preparation is needed before the operation can be undertaken with a reasonable hope of success. The number that will eventually require thoracoplasty and attain a condition permitting its performance cannot yet be estimated with accuracy.

Comment

Six different collapse procedures have already been employed in the treatment of the 172 patients referred to in this report. Operations that were not used include extrapleural pneumonolysis with packing or with extrapleural pneumothorax. The latter especially is receiving much attention in current literature and if the reports continue to be favorable, extrapleural pneumothorax will be recommended for selected patients with adherent pleuræ when contraindications to thoracoplasty exist.

The percentage of patients in this series receiving therapy (54 per cent) is not so high as that reported by Leslie and Anderson (78.8 per cent of patients admitted from June 1, 1930, to July 1, 1934, including those in residence on June 1, 1930) although as time passes a few additional patients among those under discussion may eventually require some form of surgery. Reference has been made above to five patients for whom collapse procedures were recommended and five patients who might have benefited by such treatment in addition to the ninety-three in the treated group. The theoretical maximum number of patients, in this series, treatable by collapse measures up to the present time, therefore is 103 (60 per cent).

Review of records and x-rays reveals strikingly that there are still numerous examples of lost opportunities resulting from late diagnosis. The emphasis, therefore, must again be reverted to a program of case finding, for earlier diagnosis will not only permit a greater ultilization of collapse measures but insure better results among those so treated.

Conclusions

1. A program of collapse therapy must include a variety of procedures.
2. Intrapleural pneumonolysis is indicated in about 10 to 20 per cent of cases of successfully induced pneumothorax.
3. Phreniphraxis is of value alone or supplementary to other procedures.
4. Thoracoplasty has won an accepted place in the program of collapse therapy.
5. Oleothorax, pneumoperitoneum and extrapleural pneumothorax are useful procedures in the treatment of selected patients.
6. The percentage of patients suitable for collapse therapy varies in different institutions.
7. Further extension of the benefits of surgery may be made possible by earlier diagnosis.

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DIAGNOSIS AND TREATMENT OF HEMORRHAGIC DIATHESIS*

CHARLES H. WATKINS, M.D.
Rochester, Minnesota

IN SPITE of the alarming picture that a patient with an acute hemorrhagic disease presents, a diagnosis of the type of hemorrhagic diathesis is generally not difficult to establish. There are four general types of blood conditions in which hemorrhage may play an important rôle.

Hemophilia

Hemophilia is usually readily diagnosed by the characteristic family history of hemorrhagic tendency confined to the male and transmitted by the female members of the family, by a history of frequent articular hemorrhages, prolonged hemorrhage from minor lacerations or following minor surgical procedures, as dental extraction and tonsillectomy, and by absence of petechial hemorrhage.

The laboratory finding that is most characteristic is prolongation of the clotting time of the venous blood. The prothrombin time is generally abnormally lengthened whereas the thrombocyte count is usually normal or slightly elevated, the bleeding time is within normal limits or slightly prolonged and the clot retracts if a clot is eventually formed. Examination of a stained blood smear shows no diagnostic change; there may be a secondary type of anemia, with increased regeneration of erythrocytes, and in cases of severe hemorrhage some immaturity of the myeloid cells may be present.

The literature contains reports of conditions similar to, if not identical with, hemophilia which affected females. There is usually a familial tendency toward hemorrhage and the laboratory findings are those associated with a true hemophilia and in addition there is usually a slight to moderate decrease in the thrombocyte count. In most of these cases there has been no evidence of male hemophilia. Most authors regard this condition as female hemophilia, but do not feel that this disease is the same as male hemophilia.

Pseudohemophilia has been recognized for many years and more recently has been seen with increasing frequency. The condition affects both males and females and may be transmitted by either sex directly to sons and daughters. The features are recurrent hemorrhages from mucous membranes, uterus or gastro-intestinal tract. Hemorrhage may be mild or severe; it occasionally may prove fatal but usually decreases with advancing age. Purpura is not common. Laboratory findings consist of prolonged bleeding time, normal coagulating time and normal or high thrombocyte count. The prothrombin time and clot retraction time are usually normal but they may be prolonged and may vary considerably in the same case from time to time. It is probable that many cases grouped under this heading can be more definitely placed under specific types of blood dyscrasias with future research and greater understanding of the details of the mechanism of blood coagulation.

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The treatment of hemophilia is often most discouraging. At present, transfusion offers the most encouragement in all cases of serious or moderately serious hemorrhage. Local application of coagulating snake venom (that of the fer-de-lance or of Russell's viper) is of some value in control of localized hemorrhage, particularly application to the tooth socket after the extraction of a tooth or when the venom is applied directly to the bleeding lesion. In 1936, Timperley, Naish and Clark, by the use of an extract of egg white, were able to reduce the coagulation time and control hemorrhage in cases of hemophilia when the material was given intramuscularly or intravenously. They emphasized that this substance is not a cure for hemophilia as it merely controls hemorrhage and repeated injections of adequate amounts are required to do this.

"Sango-stop," which consists principally of pectin, had been used with some success in the control of hemorrhage by Gohrbandt. The material may be used locally or given intramuscularly. In my experience this material had no apparent effect in controlling the hemorrhage during an acute exacerbation in two cases of hemophilia.

Patek and Taylor observed that cell-free normal plasma contained a substance which shortened the coagulation time of the blood in hemophilia. They have precipitated a globulin from normal plasma which, when suspended in saline solution, was as effective as whole plasma in reducing the coagulation time. This same effect could not be obtained by the equivalent material from hemophilia plasma.

Steinberg and Brown reported reduction of coagulation time by intravenous injection of a solution of oxalic acid into rabbits. Further work is necessary to establish the value of this procedure in the control of bleeding in hemorrhagic disease.

The use of various ovarian substances has not been proved of much clinical value although much investigative work has been and is still being carried out along this line. There is, however, evidence that a placental extract may produce a reduction in the coagulation time. It is hoped that in the near future, as more research is carried out, some of these substances will become available, but at present the most satisfactory and generally obtainable treatment is the local application of coagulating snake venom and repeated transfusion of blood.

Acute Leukemia

The chief problem confronting the physician who sees a patient with rapidly progressing anemia, weakness, fever and hemorrhagic phenomena is the diagnosis, since acute leukemia, aplastic anemia and thrombocytopenic purpura present similar features. An elevated leukocyte count is not always essential to the diagnosis of leukemia; in approximately 45 per cent of the cases of acute leukemia seen at The Mayo Clinic from 1929 to 1933, inclusive, the leukocyte counts were less than 10,000 per cubic millimeter.[7] It is the qualitative rather than the quantitative picture of the leukocytes that is important. Morphologically the diagnosis is made by the finding of a large number of immature leukocytes with a high proportion of stem cells in stained films of the blood. On the basis of morphologic character of these cells, leukemia may be divided into myelogenous, lymphatic, monocytic, and reticulo-endothelial types. Acute monocytic leukemia may be subdivided into two types. In one, the Schilling type, transitions from reticulo-endothelial cells to monocytes may be distinguished; in the other, the Naegeli type, intermediate stages between monocytes and myeloblasts may be seen. The former may be regarded as a variant of reticulo-endotheliosis and the latter a variant of myelogenous leukemia. In acute leukemic reticulo-endotheliosis, cells of reticulo-endothelial origin, which are more primitive than stem cells, are observed in the circulating blood, and intermediate stages between these and mature lymphocytes are found. These differentiations are of considerable academic interest but are of secondary clinical importance. Acute leukemia is characterized by ulceration of the mucous membranes, fever, anemia, and usually enlargement of the liver and spleen. Usually hemorrhagic phenomena occur late. The anemia, which is an invariable accompaniment of acute leukemia, usually is normocytic and normochromic except in the late stages of the disease when hypochromasia and signs of increased regeneration of erythrocytes are the rule. Since the platelets are usually reduced in number, bleeding time is prolonged, clot retraction is delayed or absent and coagulation is normal, prolonged, or may not occur. Petechial hemorrhages are common; articular hemorrhages are very rare.

Treatment of acute leukemia is, at best, palliative and consists principally in the administration of transfusions. Exposure to roentgen rays and radium is contraindicated for this usually aggravates the anemia and hemorrhagic features and may cause more marked immaturity of the leukocytes and more infiltration of the bone marrow and other hematopoietic organs.

Aplastic Anemia

This is a disease of unknown cause which is characterized by progressive anemia, leukopenia, absolute decrease in myeloid leukocytes, and thrombocytopenia. It progresses to a fatal termination in a few weeks in the acute form, while in the chronic form the patient may survive for months or even one or two years. The disease occurs mainly among young adults and affects females more frequently than males. The symptoms at first are mainly those of anemia. Later, as the granulocytes disappear from the blood stream, infections are common and when the blood platelet count falls to low levels, hemorrhages occur. The spleen is not palpable. The late appearance of hemorrhage and the absence of a palpable spleen point strongly to aplastic anemia. Examination of the blood smears fails to show signs of normal regeneration of erythrocytes and the reticulated erythrocyte counts are usually low but may in some cases be slightly increased. In cases in which the diagnosis is questionable, study of the bone marrow may be of value. In most cases these studies show atrophy of the hematopoietic regions and their replacement with fatty and gelatinous connective tissue. Rarely hypoplasia of the red marrow may be found and in such cases it is assumed that the end states of cellular maturation have been arrested and that immature cells are not being released into the circulation.

There is no specific treatment for aplastic anemia. Blood transfusions are only of temporary benefit but they may considerably prolong life.

Purpura Hemorrhagica

Purpura hemorrhagica, or essential thrombocytopenia, is a disease characterized by hemorrhagic phenomena and by a marked reduction of the number of platelets in the circulating blood. Two main hypotheses have been presented as to the possible mechanism of the reduction of platelets: (1) increased rate in the destruction of platelets in the spleen, and (2) a depressing effect by the spleen on the formation of platelets. The latter hypothesis has received added support in the recent experimental observations that have demonstrated the presence of a substance in the spleens of persons who had thrombocytopenic purpura. This substance, when injected into rabbits, caused marked reduction of the number of blood platelets in the peripheral blood.

Purpura hemorrhagica mainly affects children and young adults, but the patients may be of any age. The disease may be either acute or chronic; the latter is the more common type.

The chronic form of the disease is characterized by cyclic periods of hemorrhage and spontaneous remissions, in the course of which there is complete freedom from symptoms. These hemorrhagic phenomena may be minor and practically confined to a few petechiæ; they may thus escape notice until more marked symptoms of hemorrhage occur. Usually, in time, these cyclic periods of hemorrhage become more frequent and the hemorrhage becomes more severe than before, so that the disease may be regarded as acute when really the condition at hand is an acute exacerbation of a chronic condition. This cyclic tendency is so characteristic that it is a valuable aid in arriving at the correct diagnosis; the tendency is not present in aplastic anemia or acute leukemia, which present laboratory findings similar to those of hemorrhagic purpura. The acute form usually is rapid in onset and is characterized by severe hemorrhagic phenomena, but the essential factor in differential diagnosis is that hemorrhage is the first sign and is not preceded by anemia.

The laboratory findings of diagnostic significance in hemorrhagic purpura are as follows: Bleeding time is prolonged and the platelet count is reduced to 50,000 per cubic millimeter of blood or less. Retraction of the clot is delayed or absent. Coagulation time of the venous blood usually is normal but may be slightly prolonged. The number of leukocytes is normal or increased. Examination of blood smears reveals a marked decrease in, or absence of, blood platelets. Also, there is evidence of increased regeneration of erythocytes, as is evidenced by polychromatophilia and anisocytosis; these phenomena are attributable to demand on the bone marrow following loss of blood. Rarely is there any evidence of immaturity of the myeloid leukocytes unless the hemorrhage has been so severe as to produce a leukemoid reaction. Stem cells (myeloblasts) are rarely found.

Recent studies of bone marrow obtained by sternal aspiration in cases of thrombocytopenic purpura have shown a megakaryocytic hyperplasia. According to Limarzi and Schleicher, many immature megakaryocytes are present. In the acute phase the promegakaryocytes predominate and in the more chronic forms the mature megakaryocytes are in the greater proportion. In the presence of acute hemorrhage in cases of essential thrombocytopenic purpura there is a uniform hyperplasia of the bone marrow in addition to the megakaryocytic hyperplasia, while in cases in which the disease is chronic and associated with but slight hemorrhage the myeloid and erythroid hyperplasia may be absent but the megakaryocyte hyperplasia remains. Following splenectomy the bone marrow returns to normal. They concluded that essential thrombocytopenic purpura is due to faulty maturation of megakaryocytes and that splenectomy removes a factor which inhibits this maturation.

The most feared complication of this disease is cerebral hemorrhage, which frequently occurs in association with the acute form or with an acute exacerbation of the chronic form. It is often terminal and its appearance is always ominous.

Numerous other purpuric phenomena may be confused with essential thrombocytopenic purpura. The so-called allergic type of purpura is similar to hemorrhagic purpura but usually there is a definite history leading to identification of the precipitating allergic factor and the condition reappears when the patient again is exposed to this factor. Some chemical substances, particularly those that have a tendency to damage the bone marrow, such as arsenic and its derivatives, benzol, mesothorium and trinitrotoluene, may cause purpura. Rarely certain sedative and analgesic preparations give rise to the condition and exposure to extremely short roentgen rays and to radium rays may produce a picture similar to that of hemorrhagic purpura. Care in taking of the history is of great importance in eliminating these many causative factors.

There are two purpuric conditions that are not well understood but which must be considered in differential diagnosis. In Henoch's purpura, hemorrhage occurs most commonly in the intestinal tract and is associated with abdominal pain. Purpura rheumatica, or Schönlein's disease, is a similar condition in which the hemorrhage is likely to occur in the joints. The bleeding time, number of blood platelets, and other laboratory findings are practically always within normal limits in these two conditions. It is thought that these diseases are produced by an allergic mechanism.

Other confusing conditions may be dealt with briefly. Acute infectious disease sometimes produces purpura without much demonstrable change in the coagulation mechanism of the blood. This type of purpura is usually the result of injury to the walls of the capillaries. Certain deficiency diseases, such as scurvy, are characterized by purpuric manifestations, and these, likewise, may be terminal complications in many debilitating diseases. Occasionally, in a case of very severe pernicious anemia, the bone marrow may become so deficient that the number of blood platelets is sufficiently reduced to produce purpuric manifestations. The diagnosis of this condition usually is readily made and the patient rapidly improves under adequate treatment for pernicious anemia.

Many treatments for hemorrhagic purpura have been suggested but, at present, splenectomy is in favor. Splenectomy should be performed, if possible, in the period of remission of the chronic form of the disease or as early as possible in the presence either of the acute form or of an acute exacerbation of the chronic form. The risk is much increased during a period of severe hemorrhage, particularly in the acute phase of the chronic recurrent type, but if the patient is not extremely anemic the risk is less than that of allowing the disease to progress.

Giffin has classified cases of thrombocytopenic purpura as incipient and recurrent and has discussed the indications for therapy in the acute phases of each type. The recurrent type seen in the course of an acute exacerbation is most hazardous and every opportunity should be given by medical treatment to induce some indication of remission before splenectomy. In some cases, transfusion of blood may result in temporary cessation of bleeding so that splenectomy can be performed with reduced risk. In most cases, splenectomy results in cure but in certain cases, after operation, bleeding continues to a fatal termination. Since this occurs rarely it is not to be regarded as a contraindication to splenectomy but is simply a risk that must be taken.

In cases in which the disease is mild and incipient, transfusions of blood often will control the hemorrhagic tendency. Moccasin venom is said to be of value in certain of the milder forms of the disease. Large doses of vitamin C also have been used with some success. These substances are worthy of trial but one should not temporize too long if there is no evidence of improvement, and splenectomy should be performed, if possible, before a fulminating, acute stage has been reached.

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RECURRENT THYROTOXICOSIS AFTER THYROIDECTOMY*

O. J. HAGEN, B.S., A.M., M.D., F.A.C.S.
Moorhead, Minnesota

VITAL to the discussion of recurrences of thyrotoxicosis following thyroidectomy is an understanding of the causal factors of toxic goiter. And this matter of causal factors plunges the discussant immediately into the vortex of differing opinions. After three decades of research and debate, the proponents are not in agreement. So at this date, we are forced to admit that no one really knows the etiology of the toxic goiter, commonly known as Graves' disease.

Meanwhile, for the purposes of discussing the subject, I am forced to set up a series of postulates.

Postulate 1.—What has come to be termed the Graves' constitution is predisposing to the production of the thyrotoxic state.

Biologists hold that the role of heredity plays no small part in shaping individual destiny. In medicine, one conversant with the nature of disease is struck by the fact of predisposition. There is the potential diabetic, the tuberculous, the rheumatic, the vascular, and the insane. The problem of thyrotoxicity, initial or recurrent, is wrapped up in something more than the histopathology of hyperplasia present in the thyroid. Boyd[1] is responsible for the unqualified assertion that there may be hyperplasia with or without hyperthyroidism. He states further: "Marine showed long ago that when a large part of the thyroid was removed, the remaining portion showed a picture identical with that of Graves' disease, and yet the animal showed no evidence of hyperplasia. Both in animals and man, hyperplasia may be present without any symptoms of hyperthyroidism. In Graves' disease the hyperplasia may disappear and the gland revert to a colloid condition, and yet symptoms of hyperthyroidism may persist."

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*Read before the annual meeting of the Minnesota State Medical Association, Minneapolis, Minnesota, June 1, 1939.

These facts justify one in looking elsewhere than within the thyroid gland alone. Henry Plummer's theory—the hurried overproduction in the gland of an active agent, abnormal in quantity and quality—cannot, however, I believe, be wholly refuted.

In general, to solve the problem, I feel that one must search the deeps of the subconscious where brood the emotions, the obsessions, and the desires of man, and search the endocrines, which correlate and regulate his life. Certain it is, too, that the thyrotoxic patient is abnormally sensitized to psychic traumas, to infections, to severe physical and mental strains, which tend to heightened cerebration, autonomic and emotional instability, to an abnormally excitable heart, vasometer ataxia, a lowered threshold of emotional reaction. Obviously such a state will leave him in all the varying stages of physical, mental, and psychic demoralization according as one or many of these forces assail him. The Graves' constitution is a corporeal and incorporeal entity so unconditioned as to render its possessor quite incapable of reacting normally and efficiently to life's more violent impacts. He cannot "take it" as the saying runs. And so these individuals represent a strain among humans, allergic, so to speak, to the forces that play upon them, tending to overwhelm and disorganize them. These same forces playing upon the basically fit only tend to develop them the more for mastery over themselves and their surroundings. (The impacts only tend to their survival.) The Graves' constitution is therefore a vicious heritage. It is largely a man-made predisposition. Those possessing it are victims born out of a highly sensitized stock—a stock made so by a cruel world. When one studies the struggles of the race, from cave man to the man of today, his struggles through the ages against famine and pestilence, his wars, his iniquities, it is but natural that in many these impacts would leave telling taints and scars. Nor is it strange that in turn the progeny of these would bear the marks of inferiority and that for many, the trials, the disappointments, the outright frustrations, the black despairs would result in an inability to cope with the perplexities of a world beset with troubles.

Imagine a severly affected thyrotoxic patient sitting here before us. She comes for restitution at our hands. Look at her. As mute testimony of the fires that rage within, we find her a trembling, high-tensioned creature so distracted as to carry tears in her eyes; her palpebral margins are spread; her eyes look at you with a stare—the very embodiment of the emotion of fear; one or both eyes bulge, presenting the picture known as exophthalmos; the blood vessels of the neck stand out, throbbing almost to audibility; the bared chest reveals a ribbed, palpitating exterior against which barrier a throbbing engine beats; the whole body trembles from head to foot with fine constant tremors in the tongue and fingers; the skin is moist and hot. Where in any other disease do we find a body so rocked by forces from within and one so sensitive to forces from without? You and I are confronted with such a patient not infrequently and we are expected to make her whole.

We know that infections which others could cope with often overwhelm her. Salpingitis, influenza, a simple tonsillitis often touch off the trigger. The normal physiological strains incident to frequent pregnancies, abortion, and the sexual relation cut down her nervous and physical reserve levels, leaving her a quivering wreck. She tries to meet her obligations to her husband, to her children, and to her society, conditioned nervously with only exhausted batteries. She feels her inadequacy. She becomes distracted, panicky. Life's frictions are fast defeating her in the unequal contest. To meet the situation there is within a frantic effort towards equilibrium, but the whole endocrine system gets out of balance; and this already neuro-endocrine imbalance is responsible for practically all the racking evidences expressed—the rapid loss of weight, the sweating, the stare, the nervousness, tachycardia and exophthalmos. As evidence of the imbalance of the whole neuro-endocrine system, one needs only to cite that the gonadal cells in these patients act fitfully, for at one stage there is menorrhagia, then amenorrhea and sterility; the hypertension and tachycardia indict the adrenals; the tremors and the calcium aberration, the parathyroids; the sweating, the sympathetic system; the elevated blood sugar, the pancreas; the higher icteric index, the liver, etc. It seems as if all of the vital centers have united in a pernicious conspiracy to wreck the victim.

Postulate 2.—Given a Graves' constitution, the varying factors described are responsible for the constitutional symptoms characteristic of the disease. The evidences lie in the evaluation of the tangible and intangible data just presented.

Postulate 3.—The thyroid gland is the victim of circumstance rather than the arch gangster in the conspiracy. (The thyroid has been made the goat.) In this contention, the discussant has the support of some of the greatest students of the subject. They voice reservations in indicting the gland as the Capone of the gang. Many of the worst gunmen are believed to be secreted in hideouts in the deep interiors of the body; some are walking at large, suspected, in the form of husbands, brothers, sisters, mothers-in-law, neighbors, teachers, preachers; some of them are not even in human form but exist in the atmosphere that surrounds their lives, among which may be named the social unrest, strikes, the automobile, the uneconomic order, unemployment, war, and rumors of war that would rob the home of husband or son, marital maladjustment, jealousy, unrequited love, fear of everything and everybody—even of themselves. That the thyroid is a target shot through with poisoned shafts from within, of that there can be no question. That iodine imbalance in the blood results is not disputed. That in some way the thyroid has much to do with Graves' disease is proven by the fact that its removal will cure the patient in an overwhelmingly high percentage of cases. But, that even its complete removal will in many instances fail to effect a cure or prevent recurrences supports the view that the thyroid acts as transmitter. If the voltage from the high potentials within is great enough it will spill over to continue the depredation. One knows from the physics of electricity that if the air be surcharged from a high frequency, high tensioned transformer, electric bulbs lying near and about may glow. Pemberton's[2] remarks are revealing when he states: "In some manner thyroidectomy breaks an important link in the unknown chain of etiologic factors."

Really to reduce the percentage of continuing and recurrent thyrotoxicosis, three concurrent procedures are essential:

1. A careful evaluation of the patient's heredity and his environmental impacts, for not to understand and attempt to control them is to increase the number of recurrences.
2. A full evaluation of the damaged organism as well as the personality must be made that rehabilitation may be effectively inaugurated. The restoration of the thyrotoxic patient requires something more than the mere routine of rest. Lugol's, sedation, vitamin B and C, etc. These are important, maybe vital, but they are with the exception of B and C merely transient accessories to the final conquest of this malevolent disease.
3. A successful operative procedure, subtotal thyroidectomy, is considered the best single method to effect a cure.

The fact is that somehow occasionally an exophthalmic goiter patient does get well without any treatment. Somehow the termites cease their depredations and the system becomes again normally regulated. I have seen the return of a lover clear up one girl's hyperthyroidism.

X-ray will sometimes effect a cure. But let us remember that the x-ray tube cannot discriminate between thyroid and parathyroid; only a trained radiologist can do that. I have seen irreparable damage done through an unwise use of this agency.

It is important that in the surgical attack one must have precise knowledge of the local anatomy, be meticulous in his dissection, and be fully prepared to meet the emergencies that may arise in the procedure. Pemberton has well stated the reasons for the necessity of such resourcefulness to avoid catastrophes—catastrophes that will not only bring irreparable injury to the patient but also a haunting embarrassment to the surgeon. He says: "Certainly today an operative procedure cannot be termed successful, no matter how effectual has been the relief from symptoms of the disease, if a high proportion of injuries to nerves and even the occasional occurrence of severe tetany is the price."

The mortality rate incident to the surgery of the thyrotoxic patient in the hands of the more experienced surgeon has been reduced to that existent in an uncomplicated appendectomy.

Such expert surgeons as Crile, Lahey, Pemberton, Dixon, Nordland, and Arnold Schwyzer hold it down to from 0.5 per cent to 0.8 per cent. Among the occasional operators the mortality rate still rests between 13 per cent and 18 per cent, the main reasons being inexperience, inability to evaluate the patient, inadequate preparaation, ill-timed dating of operation. Any one of these factors may be responsible for the deaths. The matter of survival is of primal importance to the patient. There is no danger of a recurrence among the dead. But among those that survive there is the constant threat of continuance or recurrence of the thyrotoxic syndrome unless the rules of the great game are observed.

Thompson, Morris and Thompson[3] published a comprehensive review of the subject of recurrences, revealing that among the different series in literature the incidence ranged from 0.25 per cent to 25 per cent. In their own group of 190 patients followed from three months to six years after operation, thirty-seven (20 per cent) had either persistent or recurrent thyrotoxicosis.

These authors pointed out that the frequency with which this condition is encountered will depend in some measure on how carefully the patients are followed and how generously their postoperative course is interpreted. Of their thirty-seven patients with persistent thyrotoxicosis twenty-six were considered "much improved" by operation.

Obviously, the statistics of "recurrence" depend as stated "on how generously or critically their postoperative course is followed." In April last I performed a thyroidectomy on a patient who had been operated elsewhere for thyrotoxicosis eighteen years before—a recurrence. Another patient who had had her thyroid operated upon previously came to see a colleague a week ago for a heart disturbance. I was called in to say "hello", only to find that I had operated on her fifteen years before for toxic goiter and now she is suffering from a recurrence. Both of these patients were classified as cured. So one must conclude that the statistics on recurrences are not reliable.

In a series of 500 patients with toxic goiter operated upon by me at St. Luke's and the U. S. Veterans' Hospitals in Fargo, North Dakota, with a mortality of .8 per cent, I find after a casual survey that I must place the percentage of continuance and recurrences at about 20 per cent; that is, if I am to compare these patients' instability with normal individuals.

The recurrences twenty-five years ago may have been fewer. But then the mortality rate stood at 25 per cent and above. Then, too, the times were different. These last twenty years have been years that have tended to break both body and spirit. The World War and its sordid aftermath, the last nine years filled with depressions and recessions, with worries and fears without numbers, have taken their toll in the form of recurrences. Statistics mirror conditions, and obviously they vary for different generations. One operates to cure, but if the patient is sent back into the same hell that produced the disease originally, it is not strange that many return with the symptoms. You cure a peptic ulcer, but if the patient goes home and lives again the same life that produced the ulcer in the first place, he will return with a recurrent peptic ulcer even if you have removed the original one surgically.

Conclusions

1. The Graves' constitution is a predisposing cause of thyrotoxicosis and its recurrence after operation.

2. The more active forces tending to initiate the state are corporeal and incorporeal and may be designated as infections, psychic traumas, etc., playing upon a sensitized mechanism.

3. There is present an imbalance in the endocrine system that tends to disrupt normal function. To restore the patient, correct the imbalance.

4. The thyroid gland is participant in the vicious corporeal circle, and in some way its partial removal will sometimes completely cure and often largely ameliorate the symptoms of Graves' disease.

5. Recurrences are best prevented by a careful appraisal of the patient, by a liberal tub-total thyroidectomy, and by a carefully planned "follow-up" that will eliminate the factors responsible for the initiation of the disease.

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PELVIC PAIN*

W. A. COVENTRY, M.D.
Duluth, Minnesota

THIS rather broad subject lends itself to a very lengthy discussion of all causes of pain in the pelvis. A discussion of all its causes would lead to so much confusion that I shall limit myself briefly to some of the more common pains in this region.

Dysmenorrhea, a most common complaint, still taxes the ingenuity and skill of medicine. I like to think of a classification for this complaint as falling into three general types: (a) premenstrual, (b) menstrual, (c) postmenstrual.

The premenstrual type is probably influenced by a patient with a fundamentally low threshold to pain. One may well ask if there is in addition a spasm of uterine muscle, an obstruction of the cervical canal, a hypersensitivity of the presacral plexus, a hormonal disturbance, an endometriosis, or that rather large classification of "what have you." We may also ask ourselves in determining the cause if we can hope to alleviate the pain. Nowhere in our gynecological studies are we more taxed in finding the fundamental cause than in the large majority of cases of dysmenorrhea.

In endometriosis we may find increased thickening in the cul-de-sac which should arouse our suspicion of such a condition being present, but if the endometriosis should be of the utero-muscular type or the endometrial cells have implanted themselves elsewhere in the abdominal cavity, then our diagnostic ability is indeed taxed to the limit.

The hormone approach of dysmenorrhea has been one of the more recent theories advanced, but empirical treatment with hormones has not yielded sufficient relief to warrant the assumption that the hormones are a causative factor. There is, perhaps, much more to be learned regarding this theory.

The theory of muscular spasm induced by a tight cervical canal is old and still has many advocates for dilatation of the cervix for the relief of premenstrual pain. Often, temporary relief is obtained. This theory is also borne out in the results we have often seen, when dysmenorrhea disappears after the first baby is born.

The theory of resection of the presacral nerves for the relief of pain has been prominent in the literature in recent years. This plan has found but few advocates as failure to obtain results has been the rule and cures so few. May I warn you not to be in a hurry to perform this type of operation. Extreme care must be exercised in evaluating the case in which resection of presacral nerves is warranted and surely no promise should be made as to results. When you have exhausted all other causes of menstrual pain or, as you might say, "The Last Hope," you may advise presacral operation, but remember you are doing a major operation and it is difficult to do it thoroughly and properly.

Anodynes and antispasmodics may and must be tried, but in addition to bowel regulation and general health measures; adequate rest is most important.

The menstrual type of dysmenorrhea is usually due to malposition of the uterus, especially when accompanied by pelvic adhesions binding down a retroverted uterus. Replacement of the uterus if possible and insertion of a suitable pessary will rule out pain due to malposition.

The postmenstrual type usually is due to infection, acute or chronic, of the adnexa or uterus. Surgical intervention offers the best assurance of relief.

Aside from dysmenorrhea, other more common causes of pelvic pain are ovarian disorders. Chronic pelvic inflammation with adhesions frequently causes pelvic pain when the Graffian follicle ruptures. This pain may be of a dull dragging character but often is very acute, and severe, and may be mistaken for acute appendicitis. Indeed it is not an uncommon error to operate for acute appendicitis and be surprised to find a ruptured corpus luteum cyst. The proper diagnosis requires a most careful evaluation of the history obtained.

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*From the Duluth Clinic, Duluth, Minnesota. Read before the Minnesota State Medical Association meeting in Minneapolis, June 1, 1939.

Torsion of an ovarian cyst does cause severe pelvic pain and often is difficult to diagnose, especially if the pedicle be a long one.

In acute salpingitis the pain is severe, while in the chronic variety it is more dull, dragging or bearing down in character. Extra-uterine pregnancy causes a dull pain until rupture occurs, when the pain will become more acute.

Under the classification of infections one must not forget that endocervicitis and cervical erosions are a common cause of pelvic pain. This pain is accentuated by lifting up the cervix and thus putting the sacro-uterine ligaments on a stretch. Fortunately, this condition is easily cured by cauterization of the cervix and elimination of the infection present. Acute appendicitis, when the appendix is low down in the cul-de-sac, is an interesting cause of acute pelvic pain.

Carcinoma of the uterus, cervix, or ovaries causes no pain until it invades the parametrium or involves by metastasis the pelvic bones, when the pain may become almost unbearable. The constant encroachment of the growth confined within bony walls is unbearable, and relief can only be afforded by morphine, deep x-ray therapy, or alcohol injection of the spinal nerves. Metastasis of carcinoma from other parts of the body, especially the breasts, invading the pelvic bones, may cause most severe pain. Metastatic cancer from the intestine or stomach, the migrating cells lodging in the cul-de-sac and producing the so-called carcinoma shelf, is a most deceptive cause of pelvic pain and a growth in this region should cause enough suspicion to warrant thorough search for the original site of the malignant growth.

The psychic factor must always be considered when attempting to evaluate the amount and the character of pelvic pain. The threshold for pain in many neurotic individuals is exceedingly low. It is important to study the patient's reactions psychologically and thus be able to determine with some degree of accuracy the severity of her pain.

Thus, we may observe that pelvic pain may be due to many causes, some very simple to diagnose and treat, and some most difficult, requiring painstaking efforts after working by a process of elimination to arrive at the cause of the pain. Even then, one is occasionally unsuccessful, especially when endometriosis is the cause, but more often in those cases where the psychic cause is most difficult to diagnose and still more difficult to treat.

GREATER USE OF SURGERY IN TUBERCULOSIS RESULTS IN CHANGES IN THE HOSPITAL

Probably the most significant and far-reaching change which has come about in the tuberculosis hospital field is the trend toward surgical treatment of the disease. This has involved changes in design and equipment of the hospital, in the organization of the staff, in provision for nursing of surgical cases and development of closer relations with general hospitals. Wherever the tuberculosis hospital is not prepared to meet the demand for better operating rooms, laboratories and x-ray equipment, the facilities of the general hospital must be utilized.—Hospital Management, Sept., 1939.

LUPUS AND PULMONARY TUBERCULOSIS

Lupus patients rarely die of lupus according to the conclusion drawn from a study of 211 patients who died after attending the skin department of the Finsen Institute of Copenhagen in the last 25 years. While lupus seldom proves fatal, other manifestations of tuberculosis, particularly pulmonary tuberculosis, are a frequent cause of death. In many fatal cases of pulmonary tuberculosis the disease of the lungs become manifest shortly after treatment of the lupus had been instituted. If the lupus patient can avoid death from tuberculosis he has a good chance of living to a ripe old age.—GUDTOFT, C.N.S., Jour. Amer. Med. Assn., Sept., 1939.

HISTORY OF MEDICINE IN HENNEPIN COUNTY

BY A. S. HAMILTON, M.D.

(Continued from November issue)

In July of this year Dr. L. Bristodeau began practice opposite Francis Huot's house on Main Street, Saint Anthony. He went to Dayton.

A column of short notes in the *Minnesota Republican* of 1854, a short-lived paper, has the following facetious items:

> "Dr. Johnson will cure your eyes. Dr. Fell will fill or extract your teeth. Dr. Anderson will attend to your system generally."

In October, 1854, Drs. A. R. Lincoln and C. W. Le Le Boutellier were added to the list of practicing physicians.

January 23, 1855, saw the opening of the Mississippi suspension bridge, which crossed the river at about the site of the present Hennepin Avenue bridge, and Dr. J. H. Murphy was marshall of the day. The *Express* says of the event:

> "To the private citizens of Saint Anthony and the County of Hennepin belongs the credit, we should say the honor, and glory, of constructing the first bridge that ever carried a living being across the great river of the North American continent."

Dr. Murphy was one of the six members who urged its building, and, in spite of opposition, carried it to a successful issue.

In 1855 the *Saint Anthony Express* begins to warm up a bit toward the doctors. Probably the editorial baby had been ill, and, in September, after informing us that Dr. Leonard is putting up his own gravel house and henceforth it will no longer be an experiment that gravel houses (they are stucco now) can be erected at half the cost of other material, it goes on to say this:

> "The Doctor merits success not only in the matter of gravel wall, but in his profession. He has but lately come among us but has already added to a reputation that before was spotless."

Doubtless the *Express* meant well, but why should they spot a "spotless" reputation!

In October, 1855, there was published in the *Express* a history and business directory of Saint Anthony in which was included the following list of physicians:

Saint Anthony
- Dr. J. H. Murphy, Main Street, established 1850. He was the third physician in Minnesota.
- Dr. A. E. Johnson, established 1853.
- Dr. C. W. Le Boutellier, established 1854.
- Dr. Z. Jodon, Second Street, established 1853.
- Dr. J. A. White, Main Street, established 1853.

Minneapolis
- Dr. A. E. Ames, Fifth Street, established 1852.
- Dr. C. L. Anderson, Second Street, established 1855.
- Drs. Leonard and Wheelock, Hennepin Avenue, 1855.
- Dr. Rouse, 1855.

In December of this year Dr. Wheelock moved to Clearwater.

Dr. Rouse has not been previously mentioned. He became quite prominent in Civil War days and served as assistant surgeon of the 8th Regiment of Minnesota Infantry, from September 12, 1862, to July 11, 1865, but we have no earlier information in regard to him. An account of Le Boutellier will be given later.

Medical Methods

There is not much on which to base an opinion concerning current medical procedure. In the *Minneapolis Gazette* of February, 1855, Dr. Greeley offers a choice of operations performed with or without chloroform or ether. There is repeated reference to treatment by physiotherapy and botanical methods and much was made of the virtue of the pine-laden atmosphere of Minnesota, especially for the cure of tuberculosis.

On April 7, 1860, Dr. Sabine, who was leaving the Falls for Anoka, states that there were in Minneapolis and Saint Anthony sixteen or eighteen practicing physicians of various schools, and these in a community where the average annual mortality was a small fraction of one per cent. And the editor adds that they were equally well supplied with druggists, and the same edition reports that Dr. Leonard has gone into the drug business with a Mr. Gardner.

The *Tribune* of October 5, 1869, announces that typhoid fever is prevailing in many portions of the state, and that "This uncommon disease is probably attributable to the uncommonly cold and wet season."

HENNEPIN COUNTY MEDICAL SOCIETY

About the year 1889, the minutes of the society were lost or destroyed and, at the present time, accurate records of the transactions of the Hennepin County Medical Society exist only since July, 1897. In 1870 the founder and first president, Dr. A. E. Ames, read a paper giving a short account of the members of the society who had died or removed from Hennepin County since the society's organization, and this paper was preserved in the *Northwestern Medical and Surgical Journal* for August, 1870; unfortunately, Dr. Ames said nothing of the organization of the society other than the date—nothing of its early activity or of the medical conditions in the early years of Minneapolis. In 1901 Dr. Edwin Phillips prepared and read a paper dealing with the early days of the Hennepin County Medical Society, and this paper was published in the *Northwestern Lancet* for September 15, 1901; and at the February, 1913, meeting of the society, Dr. James E. Moore read a paper entitled "Thirty Years' Experience in the Medical Profession in Minneapolis," which I think has not been published. Beyond these papers I have not been able to find any articles dealing with the development of medicine in this immediate district.

Under such circumstances, with no official records remaining and with no one then living who was connected with the early organization of the society, to say nothing of the uncertainty of memory of those who have second-hand information of our early activity, the preparation of a paper which I published in March and April of 1918 in the *Journal-Lancet,* on the early History of Medicine in Minneapolis, was no small task. In an attempt to secure the necessary information, begun about 1912, naturally my first thought was to refer to certain of our older members, now gone, but I early gave this up as an unsatisfactory source, for memory of what happened forty or fifty years ago is very uncertain, and the most of what is given herein has been derived from a careful reading of all the papers and directories published in Minneapolis in the early years, and of all the papers published anywhere in the very early history of Minnesota, supplemented by such information as I have been able to secure from a few of our pioneers still surviving. Fortunately, the earliest papers were not dailies, and were not so voluminous as those of the present time, but, even as matters stand, an immense amount of reading has been necessary, and, if my wife had not volunteered for the task, it would never have been done. I may add that to her is largely due the credit for gathering the material for this paper.

To state that as early as October 3, 1857, there were forty-five weekly and four daily papers in Minnesota, gives some idea of the amount of reading necessary, but items regarding doctors were scarce, and, when found, they often did not agree in details and dates with accounts given in other places by early writers, and even if accessible, they have been, in some instances, deleted and corrected, to a degree greatly impairing their authority, by later medical readers who evidently disagreed with the recorded matter.

Dr. Dunsmoor, in "Hudson's Half Century of Minneapolis," and the "Tribune City Directory" for 1873-1874 are authorities for the statement that the Union Medical Society (the precursor of the Hennepin County Medical Society) of Saint Anthony and Minneapolis, was organized in 1855 at the residence of Dr. A. E. Ames, who was elected president, with Dr. Wheelock, secretary. In at least two other places the date of organization of the society is given as 1856, but if there be any doubt on the subject it would seem to be removed by a statement of Dr. A. E. Ames in the *Northwestern Medical and Surgical Journal* of August, 1870, that the society was organized June 20, 1855. Neill's History gives the following account of the organization:

> "The Union Medical Society was organized early in 1856 with Dr. A. E. Ames, president; Dr. C. L. Anderson, vice president; Dr. Wheelock, secretary, and Dr. C. W. LeBoutillier, treasurer. Amongst the old members were Drs. A. E. Ames, Anderson, Wheelock, LeBoutillier, Johnson, Leonard, Lowenburg, Ortman, White, and Dibb. On June 7, 1870, the Society reorganized as the Hennepin County Medical Society. The meetings are held the first and third Mondays at places designated before adjournment."

Neill's date is correct for the period of a re-organization (June 8, 1870), but the change of name to "Hennepin County Medical Society" was made in either March or April, 1869. (See later notes.)

The following account is from Dr. Edwin Phillips' article, already mentioned:

> "The Hennepin County Medical Society was organized in 1856, a meeting for this purpose being held at the private residence of Dr. A. E. Ames, which was a small house situated between the old county jail and Ninth Avenue South. The house faced on Fourth Street, but stood far back in the yard so that it was nearer Fifth than Fourth Street. The founders and charter members of this Society were Drs. A. E. Ames, Chas. L. Anderson, Asa E. Johnson, A. Ortman, John H. Murphy, Wm. H. Leonard, C. W. LeBoutillier, Dr. Sewingburg (Lowenburg?), and Dr. Wheelock.
>
> "Dr. A. E. Ames was elected the Society's first president, and Dr. Charles L. Anderson the first secretary. The Society adopted a program of essays, reports of cases, and discussions, much the same as the Society is working under today. Dr. Asa E. Johnson furnished the first essay read. The methods of carrying on the Society during its primitive years from 1856 to 1871, a period of fifteen years, were as follows: After the program of reading and discussing the papers was carried out the titles of the papers for the next meeting were announced, thus giving each member one month's time in which to prepare for the discussion of the papers for the next meeting, and the discussions were thorough and general.
>
> "As the Society had no permanent place for meetings they were held in the offices or residences of members. When held at the residence of some member, his wife and daugh-

ters usually invited the members after the meeting was adjourned to a luncheon of coffee, cake and sandwiches. * * * Some of the favorite places for holding meetings were at the residences of Dr. Wm. H. Leonard, Fifth Avenue North and Second Street, or Dr. John H. Murphy, on the corner of Sixth Street and University Avenue Southeast.

"During the Civil War the Society discontinued its meetings. In the fall of 1865 it was re-organized with Dr. A. E. Ames as president and Dr. Alfred Lindley as secretary. Dr. Ames went to California in the sixties, and during his absence Dr. Nathan B. Hill was elected president, and he held the office till Dr. Ames returned home, when he was again elected president and held the office until his death.

"It may be of interest for those here to know that the first president of our Society was a licensed attorney. He was admitted to the bar at the time when Judge Flandrau of Saint Paul was filling the office of county judge in Hennepin County.

"The Hon. Eugene Wilson moved to admit Dr. Ames to the bar. The doctor had at that time completed his new house, which is still standing at the corner of Fourth Street and Eighth Avenue South, opposite the old county court house. He decided to christen the new house by giving the legal fraternity a royal banquet in response to the honor conferred on him.

"The late John H. Murphy gave the Society its first banquet, some time in the sixties, in the small house on the corner of Sixth Street and University Avenue Southeast. Notwithstanding the fact that the house was small the banquet was immense, and consisted of an old-fashioned bill of fare from roast turkey and cranberry sauce down to the finest fruits of the season. The doctor having more than an ordinary stock of good common sense and a stock of jokes always on hand made this an event long to be remembered.

* * *

"Since the death of Dr. A. E. Ames, which occurred in 1875 (1874), the following named members of the Society held the office of president during the interval from 1875 to 1885:

"Drs. Nathan B. Hill, Calvin Goodrich, Alfred Lindley, D. M. Woodling, Charles Simpson, Edwin Phillips, O. J. Evans, Charles Wells, A. H. Salisbury, and J. W. Murray. The other members of the Society, not mentioned elsewhere, between 1865 and 1885, were Drs. C. C. Clark, Winthrop Miller, L. F. Damm, W. A. Hamilton, C. E. Rogers, Wm. Hutchinson, J. W. McDonald, C. Cockburn, G. F. Townsend, H. H. Kimball, Archibald Fairburn, J. L. Linn, Henry Keith, Richard Hill, H. S. Hubbard, Cyrus Smith, Charles S. McCollom, Robert S. McCurdy, J. H. Hammond, H. F. Latz, D. F. Collins, Mary Whetstone, A. S. Whetstone, Columbus Slagel, C. J. Spratt, J. H. Dunn, E. J. Brown, J. T. Moore, T. L. Laliberte, E. N. Sharp, W. A. Jones, and others whose names I cannot recall.

"In closing this report I cannot refrain from speaking particularly of some of the pioneer members who have died since 1871. Dr. A. E. Ames, the first president, was a rare presiding officer, cool, impartial, and conscientious. Dr. Calvin Goodrich was a smooth and ready debater and always took an active part in the discussions. Dr. Nathan B. Hill won the esteem of the Society by his thoughtful and argumentative manner in discussing medical topics. Dr. J. W. Murray was a close student, and always ready to take part in the discussions. Dr. Hamilton, although young in the profession, won for himself a high type of professional honor. Dr. John H. Murphy won for himself an honorable reputation as a general surgeon and practitioner. Dr. Winthrop Miller served the Society in a scholarly way by his essays and discussions. Drs. Clark and Salisbury served the Society long and faithfully as secretaries. Dr. L. F. Damm won for himself an honorable position in the Society as a chemical expert. Dr. A. Ortman, one of its charter members, was at all times conscientious, honest, truthful, and labored faithfully to elevate and build up professional character. Dr. D. F. Collins was a fine scholar, and added much to the literary work of the society. These gentlemen have written their last essay and made their last address, and have passed on to a bright and beautiful eternity."

The first mention of the Society found in any of the papers available is in the *State Atlas* of December 3, 1862, as follows:

"The Union Medical Society of St. Anthony and Minneapolis met on the twenty-first ultimo at the office of Dr. Ward in Minneapolis. The following officers were elected: A. E. Ames, President; R. H. Ward, Secretary; A. E. Johnson, Librarian; Drs. Johnson, Ward and Lowenberg, Committee of Medical Ethics; Drs. Leonard, LeBoutillier and Hill, Committee on Publications. Three new committees were appointed as follows: Drs.

Ames, LeBoutillier and Johnson, Committee on Epidemic Diseases; Drs. Johnson, Leonard, Ortman and Hill, Committee on Diseases of Respiratory Organs; Drs. Ward, Lindley and Lowenberg, Committee on Chronic Diseases of Digestive System.

"On motion it was resolved: That as Drs. Murphy, LeBoutillier and Greeley, members of the society, are engaged in medical services in the Federal Army, they be and are hereby requested to correspond with the Society, furnishing such information in regard to the hygiene of the Army and its Medical and Surgical Practice as might be of interest to the Society. It was also on motion—

"Resolved: That a summary of the proceedings of this meeting be published in the local newspapers and that all physicians engaged in regular practice of medicine be invited to coöperate with us in accomplishing the object of the Society, particularly in establishing a standard of high professional etiquette and in obtaining and disseminating, through the profession, information in regard to epidemics, the influence of our climate upon chronic diseases and other similar questions of local interest. By order of R. H. Ward, Secretary of the Society."

Judging from the above and from the item of July 6, 1864, the society did not wholly discontinue during the war.

It is notable, also, that in all the early records the Committee on Ethics occupied a prominent place in the list of officers, and there was a continuous effort to maintain a high standard, but men were continually being tried for violating the principles of ethics laid down. For example, it is related that on one occasion the society passed a resolution that no physician, not a graduate of a medical college, could be a member of the local society. The secretary had been particularly active in securing this piece of legislation which automatically dropped one of the members from the rolls. The member who had been dropped went east and in due course of time returned with a diploma, and then proceeded to investigate the secretary, who was found to be masquerading under a false diploma and was in turn dropped.

The stealing of patients also appears to have been an all too common procedure, and was as frequently a topic of conversation as is fee-spliting in our day. Considering the high character of the men involved, it may not be invidious to relate the following story told me by Dr. A. W. Abbott, as showing the spirit of the times. On one occasion Dr. Phillips, meeting Dr. Ames on the street, said to him: "Hold on, I want to talk to you. You have been stealing my patients, but every time you steal one from me I will steal three from you to get even." Conditions such as this gave rise to the statement that the physicians with the fastest horses always had the most patients.

The *State Atlas* of March 9, 1864, reports ten lawyers in Minneapolis, and five in St. Anthony, with ten practicing physicians on both sides of the river. "Strangers can calculate how long they can live and grow rich at the Falls."

Hereafter follow all the newspaper notices which offer material information concerning the Society. A complete list of all items can be found in the *Journal-Lancet* of March and April, 1918. There are wide gaps, some of which may be filled by members or by further research, but it has required a tremendous amount of labor to achieve even this incomplete result. From 1867, when the *Daily Tribune* began publication, it is possible at least to keep track of the annual meetings and election of officers, and the latter are given, too, in the directories beginning in 1873 and being continuous except for several years hereafter mentioned.

Information is lacking in regard to the years from 1857 to 1866; yet, however much uncertainty there may be in regard to the other officers, there would seem to be little doubt as to who the president was in these forgotten years.

Dr. Ames was the first presiding officer, and appears to have been a fixture, save only during his absence in California in 1868, until his death in 1874, when he was succeeded by Dr. Simpson, who was vice president at that time.

State Atlas, July 6, 1864:

> "At a meeting of the physicians and surgeons held in Minneapolis at the office of Dr. Hill and Dr. Lindley, July 1, 1864, the following fees were established for the present:

"For a visit in town	$2.00
"For a night visit in town	3.00
"When called into the country, per mile	1.00"

Evidently inspired by the foregoing, we find the following announcement in the *Tribune* of July 20, 1864:

> "Dr. J. S. Eliot wishes to return his sincere thanks to his numerous friends for the liberal patronage hitherto bestowed and by his past successes in curing diseases and by physio-medical system of practice he hopes to merit a continuance of the confidence of a generous public.
>
> "The greatly increased price of medicine of all kinds compels the undersigned to advance his fee bill as he furnishes his own medicines instead of sending to the drug-store for them any time he makes a visit or prescription. For a visit in town and medicine, $2.50.
>
> "Special attention given to all diseases of the throat and lungs.
>
> "Jacob S. Eliot, Botanic Physician, Minneapolis, Minn."

The *Tribune,* in February, 1867, remarks facetiously that lawyers and doctors are getting as numerous here as mud-hens on a summer marsh.

The *Minneapolis Daily Tribune,* of May 29, 1867, gives the professional cards of J. S. and A. F. Elliot, and then announces that A. F. Elliot "embalms the dead."

Daily Tribune, June 6, 1867:

> "The Union Medical Society of St. Anthony and Minneapolis met yesterday afternoon at Dr. Ames' office. The following officers were elected: A. E. Ames, President; N. B. Hill, Secretary; A. H. Lindley, Librarian; Committee on Ethics, Drs. G. S. Scott, A. A. Ames, J. S. Brown. Committee on Publications, Drs. O. J. Evans, Geo. W. Hall, A. Ortman. Resolved that this Society is highly gratified with the progress made in placing our city under proper sanitary regulations."

The latter statement may refer to the sanitary committee mentioned in the next paragraph.

Merwin's Directory, 1867:

> "Saint Anthony and Minneapolis Union Medical Society meets on the first Wednesday of each month at 7:00 p. m. at the office of Dr. Ames, corner Bridge Square and Washington Avenue. President, A. E. Ames, M.D.; Secretary, N. B. Hill; Librarian, A. E. Johnson. Sanitary Committee, A. E. Ames, N. B. Hill, A. H. Lindley."

(To be continued in January issue)

President's Letter

NOBODY realizes better than outgoing officers that policies do not change materially in an organization such as ours. Officers seldom do more than interpret policies. They are in excellent position, however, to observe progress and evaluate undertakings. For that reason as the year draws to a close, we should like to sum up very briefly some of our impressions of the year 1939—a year that has merely brought another milestone in a steady past growth that has placed the Minnesota State Medical Association among the leaders of forward looking medical associations of the country.

January, 1939, found the American Medical Association under criminal indictment for monopoly in restraint of trade and Congress about to be asked to appropriate millions of dollars for a new health program. It found many state medical associations feverishly at work on health insurance plans and passage of enabling acts. It found a grave concern among Minnesota physicians over the national situation, but no immediate preparations for radical departures here. Instead, the Minnesota State Medical Association was busy with a new and extensive program of co-ordinated medical and public health education. In cooperation with the University, the State Board of Health and other state directed activities, it was reaching out into new fields of postgraduate education. It was continuing its established programs of education to the public and especially its information to legislators on all legislative proposals touching medicine and the public health. It was continuing its studies on social and economic conditions affecting medicine and participating in the American Medical Association Survey of Need and Supply of Medical Service. It was carrying forward its policy of intimate coöperation with official agencies in the administration of relief and of social security aids.

Looking back we believe that the coördinated program has been of value. Information to the legislature has been so ably handled that no measures of any kind, which might be detrimental to the public health, have passed our Minnesota Legislature. Also the signal legislative gain of last year by which the relief client was given his choice-of-vendor was made specific for services in the new law. The new Division of Social Security has shown a disposition to work as closely with the doctors as former administrators in the handling of medical care for recipients of relief and aid. Furthermore, results of the survey have borne out the experience of all who are familiar with conditions—that medical facilities are adequate in Minnesota and that there is no need for hasty experimentation here with new forms of medical service.

During the year, the Association has been carefully studying the experiments in medical insurance in other states. The time devoted to some of these experiments, especially those in which organized medicine in a locality, county or state has taken charge directly or indirectly, has been so short that no definite judgment can yet be entered. The Association has deemed it best, so far, to watch carefully all of these various efforts, gather all the information it can on medical insurance problems, and from this background, be in a position to help any locality or county choosing to try such an experiment.

As the year ends, the indictment against the American Medical Association has been thrown out of court and the decision of the judge has been upheld by the Supreme Court. Also the Wagner Health Bill, never reported out of committee last year, faces grave competition for the attention of Congress in the 1940 session.

In this connection a bit of philosophy recently quoted from Elsa Maxwell may have some applicability to us as physicians in our relation to social and economic problems: "Take the serious things more lightly and the light things more seriously." We have wondered of late, as we watched, whether physicians should not take heed. Perhaps if we attend enough to the problems in our towns and our own states, the national problems will take care of themselves better. At least we shall have more proven experience to contribute to the national cause.

We wish space might permit the recording of the splendid activities of many individuals in our Association and the excellent work of the committees. However, where to begin and where to end would be a difficult matter to decide.

To our full-time and part-time faithful workers, to fellow officers, the council, all of the committees and the entire membership, thanks for your patience and coöperation. To the new president and all of his workers, best wishes for the coming year.

Sincerely,
GEORGE EARL, President,
Minnesota State Medical Association.

EDITORIAL

MINNESOTA MEDICINE

Official Journal of the Minnesota State Medical Association

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BUSINESS MANAGER
J. R. Bruce

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THE PLATFORM OF THE AMERICAN MEDICAL ASSOCIATION

THE accusation has been made that the physicians of the country through their organization, the American Medical Association, oppose all change in medical practice. For this reason the trustees of the American Medical Association have adopted the following platform, which well expresses the viewpoint of the physicians of the country regarding methods which should be adopted and general principles which should be followed in legislation. The platform consists of eight planks:

1. The establishment of an agency of federal government under which shall be coördinated and administered all medical and health functions of the federal government exclusive of those of the Army and Navy.

Since 1875 the American Medical Association has advocated the establishment in the federal government of a single agency, not necessarily a department with a cabinet representative, to administer the various health activities of the government. At present the United States Public Health Service is in the Federal Security department; the Maternal and Child Welfare Bureaus in the Department of Labor; the Food and Drugs administration in the Department of Agriculture, et cetera. Such a reorganization would result in the avoidance of duplication, greater efficiency and great economy.

2. The allotment of such funds as the Congress may make available to any state in actual need for the prevention of disease, the promotion of health and the care of the sick on proof of such need.

Physicians recognize the need for federal appropriations for certain public health activities. They have advocated the appropriation of funds for campaigns against maternal mortality, venereal diseases and cancer. They have recognized the necessity of providing medical care for the entire population and have given generously of their time. They have protested, however, against the allotment of federal funds to be matched by the states for the wholesale increase of medical activities with no consideration of actual need. Too often the government has to sell the idea to the states that here is money available for activities the states did not think they needed. Taxpayers too frequently look upon federal grants as gifts and forget that they themselves furnish the funds, directly or indirectly. The physicians propose, therefore, that if a state presents concrete proof of the need of federal assistance for the prevention of disease or the care of the sick, such state be aided individually.

3. The principle that the care of the public health and the provision of medical service to the sick is primarily a local responsibility.

The principle of the local determination of medical need and the local provision and administration of medical relief is fundamental. Neighbors and local officials are in a much better position to determine who need assistance than officials or their clerks in Washington. There might be danger of a locality shifting its own responsibility entirely to Washington.

4. The development of a mechanism for meeting the needs of expansion of preventive medical services with local determination of needs and local control of administration.

The profession recognizes the necessity of expanding public health activities and proposes that a federal agency would be the proper one to give advice and suggestions, but that local officials should determine the need and expend the available funds.

5. The extension of medical care for the indigent and the medically indigent with local determination of needs and local control of administration.

This plank takes into consideration the fact that in one locality a certain low income group may be medically indigent (that is, may be able to meet the cost of essentials such as food and shelter, but not the cost of a medical emergency) while in another locality this group would not need help. The medical profession is desirous of solving the problem of providing proper medical care for this low income group. It believes, however, not in blanket regulations for the whole country, but in local determination of needs and administration of remedies.

6. In the extension of medical services to all the people, the utmost utilization of qualified medical and hospital facilities already established.

Claims regarding the need of more hospitals in the United States have been grossly exaggerated. Reliable statistics show that there are only thirteen counties in the country more than thirty miles from a suitable hospital. There are more hospital beds in this country per 1,000 population than in any other country in the world. Furthermore, the private hospitals are only 70 to 75 per cent filled. The indiscriminate locating and building of hospitals by the government, such as has already been reported, is gross extravagance and unfair to already existing hospitals. The sensible solution is the utilization of present facilities.

7. The continued development of the private practice of medicine, subject to such changes as may be necessary to maintain the quality of medical services and to increase their availability.

The profession knows that the institution of private practice provides the best medical care for the people. Any changes which should be made in making adequate facilities more available to those unable to pay the present cost should not sacrifice private practice itself. In other words, we are opposed to all proposals whereby the physician is directed and controlled by the government. The low mortality and the high plane of the health of the American people compared with that of all other countries, vindicates the system of private practice.

8. Expansion of public health and medical services consistent with the American system of democracy.

Physicians believe in democracy and not in a paternalistic form of government. There is some basis for the belief that nationalizing the medical profession is the first step toward socialism or totalitarianism. Handouts by the Roman governments doubtless led to the downfall of the empire. Individual responsibility and reliance were sacrificed for temporary security. The average citizen wants to continue to exert his freedom of choice when it comes to a physician. The average physician wants to continue to stand on his own feet.

NATIONAL PHYSICIANS' COMMITTEE FOR THE EXTENSION OF MEDICAL SERVICE

WHEN Mr. Frank Gannett, the well known newspaper editor of New York state and the inspiration of the National Committee to Uphold Constitutional Government, allowed his name to be proposed as presidential candidate for the Republican Party, the non-partisan character of this committee became lost. The Physicians' Committee for Free Enterprise in Medicine, which was closely associated with the Gannett Committee, lost thereby its non-partisan character. For this reason a group of prominent physicians formed a new committee, which is known as the National Physicians' Committee for the Extension of Medical Service, to carry on the activities of the Physicians' Committee for Free Enterprise in Medicine in a strictly nonpartisan way.

Dr. Edward H. Cary of Dallas, former president of the A.M.A., is chairman of the new committee. Dr. Austin Hayden of Chicago is secretary and Dr. N. S. Davis, III, of Chicago is treasurer. The other members of the National Committee are—Dr. Irvine Abell, Louisville; Dr. F. F. Borzell, Philadelphia; Dr. John A. Hartwell, New York; Dr. Roger I. Lee, Boston; Dr. A. McMahon, Saint Louis; Dr. E. H. Skinner, Kansas City; Dr. W. F. Braasch, Rochester; and Dr. C. B. Wright, Minneapolis.

The purposes of this National Committee are the making more widely available the services, more generally known the achievements, and safeguarding the independence of American Medicine.

When one considers the high plane of medicine in the United States, the low mortality and morbidity in its population, and the general availability of medical care, there seems to be little excuse for the determined efforts being displayed to revolutionize medical practice in this country. Propaganda in its worst form is being fostered, even by the federal government, through lay magazines, the press and the radio in an effort to discredit the medical profession. There is need for this new National Committee of physicians to operate in a national sphere, as our state medical associations are doing within state borders, to bring the truth to the public and to do everything possible to maintain free initiative in medicine for the good of the public.

A small group of physicians from throughout the state met in Saint Paul, November 4, at the call of Dr. F. J. Savage, to hear Mr. John M. Pratt, executive administrator of the new National Physicians' Committee, explain the objectives of this new committee. Mr. Pratt resigned his former position with the Gannett Committee and will take part in meetings all over the country similar to the Saint Paul meeting, which was the first.

Dentists, pharmacists and other allied groups, interested laymen, as well as physicians, will be given the opportunity to support this nationwide committee, by becoming members and making any contributions they are able. The purposes of this National Committee supplement and in no way conflict with the activities of the A.M.A. It is not generally understood that the propaganda and legislative activities of the A.M.A. are limited, inasmuch as its main function is the scientific betterment of its members. If any considerable part of its activities were devoted to legislative affairs, the organization would be subject to the income tax according to the regulations of the powers that be.

MEDICINE AND THE JUDICIAL MIND

MORE than at any other time in its experience the medical profession is having occasion now to pay attention to the higher courts and the men who compose them. On the ultimate outcome of the present effort in Washington hangs the very life of medicine as a profession and we who are members of it would be lacking in a very human characteristic if we did not do a little quiet wondering as to the type of men who are the arbiters of our professional destiny.

The recent death of Justice Butler enhances this feeling of curiosity, for now there will be five out of the nine men in the Supreme Court appointed by the present administration and avowedly sympathetic to its trends and ideas. What will be their attitude toward this movement to undermine the fundamental principles of our profession and make a trade of our vocation and a union of our organization? Admitting that they may be friendly to the social security angle of the matter and therefore inclined to agree with the administration's course of action, will they lose sight of the fact that their own profession is no less vulnerable than ours, and will they want to see it "socialized" too?

In a book recently published by the University of Minnesota Press, entitled "Marshall and Taney, Statesmen of the Law," the author, Mr. Ben W. Palmer of the Minnesota Bar, goes into matters like this very ably. The first chapter, with the caption "Are Judges Human Beings," covers thirty-six pages in an analysis of a three-hundred-year period in history, which in the light of present events should be of great interest to every one of us, as well as the author's critical study of the lives of the two men whose names constitute the title of the book. The historical background of the present situation should be very illuminating.

G. C.

MEDICINAL SOURCES OF VITAMINS A AND D

THE onset of winter again gives emphasis to the frequent necessity during these months to supplement the dietary vitamin intake of patients, particularly in vitamins A and D, with medicinal sources of these vitamins.

The minimum daily intake of vitamin A from all sources necessary to prevent evidences of deficiency is 4200[1] to 5200[2] U.S.P. units for infants, 5500[1,2] units for children, 6250[3] units for adults, and 8700[2] units during pregnancy and lactation. The recommended minimum daily intake of vitamin D is 625[3] U.S.P. units for all ages, with at least 800[4] units during pregnancy and lactation. It should be noted that these are minimum rather than optimum requirements, which are 3 to 4 times these amounts.

Carotene is the chief source of vitamin A alone; irradiated ergosterol of vitamin D alone; while the fish liver oils constitute a potent source of both vitamins. The differing vitamin content of the various fish liver oils has, however, given rise to some confusion.

Cod Liver Oil, U.S.P., is required to have a minimum vitamin content per gram of 600 U.S.P. units of vitamin A and 85 U.S.P. units of vitamin D. The recommended U.S.P. dose of 8 c.c. (2 drams), therefore, yields 4800 units of A and 680 units of D. Numerous overstrength preparations of cod liver oil are available, permitting proportionate reduction of the dosage volume, but considerable caution is necessary in employing these preparations to be sure that the D component has been increased proportionally to the A component. The D:A ratio in U.S.P. cod liver oil is 1:7 and this ratio should be maintained, or at least should not be lower than 1:10 in these stronger preparations.

Burbot Liver Oil, N.N.R., is obtained from the only fresh-water member of the cod family. It is seven and one-half times stronger than a standard cod liver oil in both vitamin components, and the recommended dose of 1.0 c.c. (15 minims) furnishes 4480 units of A and 640 units of D.

Halibut Liver Oil, N.N.R., is seventy-five times as potent as a standard cod liver oil in vitamin A, but is only six times as potent in vitamin D, the D:A ratio being 1:90. The recommended dose of 0.2 c.c. (3 minims) furnishes 8960 units of A but only 108 units of D. Halibut liver oil is, therefore, a relatively poor source of vitamin D. This relative deficiency of vitamin D is overcome in the preparations of Halibut Liver Oil with Viosterol by the addition of enough viosterol to make the oil 100 times as potent in vitamin D as a standard cod liver oil, the 0.2 c.c. dose then yielding 1700 units of vitamin D.[5]

Percomorph Liver Oil, N.N.R., is obtained chiefly from tuna and is 100 times as strong as a standard cod liver oil in both vitamins. The recommended dose of 0.2 c.c. (3 minims) yields 12,000 units of A and 1700 units of D, or approximately twice the minimum requirements for both vitamins.

Where it is desirable to administer either of the vitamins alone Carotene in Oil, N.N.R., as a source of vitamin A only, furnishes 6600 units of this vitamin in the recommended dose of 0.9 c.c. (14 minims), while Viosterol in Oil, N.N.R., as a source of vitamin D only, yields 2000 units of vitamin D in the recommended 0.2 c.c. dose.

HAROLD N. WRIGHT, Ph.D.

CHRISTMAS SEALS

THE approach of the thirty-third annual Christmas Seal sale brought an enthusiastic approval of the campaign from Dr. Rock Sleyster, Wauwatosa, Wisconsin, president of the American Medical Association. "It is a pleasure," he said, "to give my hearty endorsement to the Christmas Seal campaign of the National Tuberculosis Association. I have been actively interested in this promotion for the last quarter of a century."

The sale of the Double-Barred Cross seals is identified with the fight against tuberculosis which is being carried on in this country by nearly 200 affiliated organizations, of which the Minnesota Public Health Association and county organizations are a part. The sale opens November 30 and continues through Christmas Day, with the theme this year being, "Protect Your Home From Tuberculosis."

The Minnesota State Medical Association is actively coöperating with the campaign. Included in the Speakers' Library Service material is much valuable information prepared through the coöperation of the State Medical Associationi with the Minnesota Board of Health and the Minnesota Public Health Association.

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[1] Stiebeling, Bur. Home Econ. Rep., 1936.
[2] Comm. on Nutr., League of Nations, 1935.
[3] New and Nonofficial Remedies, 1939.
[4] Jeans and Stearns, J.A.M.A., 111:703, 1938.
[5] Wright and Montag, Textbook of Materia Medica, Pharmacology and Therapeutics, W. B. Saunders Co., Philadelphia, 1939.

Fortunately, we have two strong allies in outwitting tuberculosis—the tuberculin skin test and the chest roentgenogram. Indeed, so effective is this defense that if we could apply it universally we might hasten the eradication of tuberculosis by several decades.

Individuals with active tuberculosis are diminishing in number, but, by the same token, are vastly more difficult to detect. Undetected, they are just as deadly to those with whom they come in contact as they were at the turn of the century. The menace is still with us. It will be increasingly difficult to locate the remaining cases and more costly per case when discovered. Yet there is no other way except to work eternally at it, despite the labor involved, despite the immediate cost. As long as a single case of tuberculosis exists in a community the job is not done. No home is safe from tuberculosis until all homes are safe.

E. A. M.

BUY
CHRISTMAS SEALS
PROTECT YOUR HOME
FROM TUBERCULOSIS

In Memoriam

Carl D. Kolset
(1876-1939)

Dr. Carl D. Kolset, Sanborn, Minnesota, died at his home, October 18, 1939, following an illness of three years.

Dr. Kolset obtained his medical degree at Hamline University in 1905. He practiced medicine at Brooten from 1910 to 1916 when he moved to Benson. In 1921 he moved to Sanborn where he practiced until illness forced him to retire in 1938.

Dr. Kolset was a native of Norway. He was active in civic and church affairs during his residence in Brooten and served for a time as president of the village council. He was a member of the Redwood-Brown County Medical Society, the Minnesota State and American Medical Associations.

* * *

George Aitken Stevenson
(1854-1939)

Dr. G. A. Stevenson of Albert Lea died October 25, 1939, at the age of eighty-four.

Dr. Stevenson was born in 1854. He attended the College of Physicians and Surgeons at Keokuk, Iowa and obtained his degree from Rush in 1889.

Dr. Stevenson practiced for years in Alden before moving to Albert Lea. He later specialized in eye, ear, nose and throat diseases. He was a member of the Freeborn County Medical Society and was its second secretary, succeeding the late H. Hamilton Wilcox. He was also a member of the Minnesota State and American Medical Associations.

For years past Dr. and Mrs. Stevenson have been making their home at the Hotel Albert, Albert Lea, where the doctor was a well-known character.

Dr. Stevenson is survived by his wife and two children, Robert of Chicago and Mrs. B. J. Clausen of Boone, Iowa. One son, George, died a number of years ago in the west.

* * *

Victor Rousseau
(1872-1939)

Dr. Victor Rousseau of Maple Lake, Minnesota, died October 26, 1939, at the age of sixty-seven.

Dr. Rousseau was born at French Lake, Minnesota, July 20, 1872. He attended the Northern Indiana College at Valparaiso, Indiana, where he received his degree in pharmacy in 1901. Attending the University of Minnesota, he obtained his M.D. degree in 1905. His internship was served in Saint Luke's Hospital, Saint Paul.

Dr. Rousseau was a member of the Wright County Medical Society, the Minnesota State and American Medical Association. He served at one time as Health Officer of Maple Lake.

THE PILGRIMAGE TO ROCHESTER IN HONOR OF DR. WILLIAM J. MAYO AND DR. CHARLES H. MAYO*

INTRODUCTORY REMARKS

GEORGE EARL, M.D.
President of the Minnesota State Medical Association
Saint Paul, Minnesota

WE have come here today to pay a very special tribute to two great men—our friends—who have left us.

These men were recipients of honors and tributes without number during their lifetime and after their deaths. We can add nothing, perhaps, to the brilliance and variety of the things that have been said about them nor to the weight of distinction of those who have said them.

We are here instead to acknowledge the special debt and express the special affection in which these two men were held by their medical colleagues in Minnesota.

It is safe to say that Dr. Will and Dr. Charlie regarded themselves first as country doctors of Minnesota no matter what splendid titles and degrees were bestowed upon them. They were devoted to their own town, their own people, their own state and to their fellow practitioners in Minnesota. They brought an added luster to all men who practice medicine in Minnesota. But more than that, they never failed in personal kindliness and in helping a fellow practitioner. They were loyal members of the Minnesota State Medical Association and served it faithfully as members and in the highest offices the association had to bestow. They attended meetings as a matter of habit and example and year after year they themselves and the members of their organization have made unique contributions to our programs. They made tremendous contributions to the education of physicians in Minnesota and to elevation of our standards of practice. Every one of us has reason to be grateful for their friendly assistance and every one of us has benefited by their work.

This memorial pilgrimage is designed to give expression to this feeling of gratitude and of affection. The term pilgrimage is unusual. It was suggested to the Council by Dr. E. L. Tuohy and was retained because it conveys a special significance. It carries with it a spiritual association which is not inappropriate for physicians of Minnesota who are today visiting the graves of two of their greatest men.

We hope that all of you will join the procession that forms immediately after Dr. Tuohy's address here, when we join Dr. Charles W. More and Dr. Arnold Schwyzer in placing the wreaths of the Minnesota State Medical Association on the graves at Oakwood cemetery.

It is especially appropriate that Dr. E. L. Tuohy of Duluth should express for us here our feeling as fellow practitioners for Dr. Will and Dr. Charlie. Dr. Tuohy has known them intimately. He has practiced medicine with distinction for many years, and he has been associated with the work of our association. He speaks with authority for the average practitioner of medicine in Minnesota.

It is also fitting that Dr. Arnold Schwyzer of Saint Paul and Dr. Charles W. More of Eveleth should be selected to place the wreaths on the graves of these illustrious men.

Dr. Schwyzer has been chosen to place the wreath honoring Dr. William James Mayo. This choice is most fitting, for Dr. Schwyzer was the contemporary of the Mayos not only from the standpoint of time of practice, but also in personal friendships and acquaintance and in outstanding medical achievement.

Dr. More has been chosen to honor the memory of Dr. Charles Horace Mayo because of his close personal relationship with the great medical leader. They were classmates in medical school, and through the following years a warm, intimate friendship continued between them. Dr. More has achieved an enviable reputation and is recognized as a man of highest personal standing, truly representative of Minnesota medicine.

AN EXPRESSION FROM THE MINNESOTA STATE MEDICAL ASSOCIATION

EDWARD L. TUOHY, M.D.
Duluth, Minnesota

WHATEVER is spoken here today matters little in comparison to the circumstance of our presence and participation in the ceremonies planned and arranged by our State Association. We have invited ourselves to come and to do honor to two of Minnesota's greatest sons. They were our fellow members. Fame came to them within our vocation—the field of Medicine. It is futile to compare them with other contemporaries or attempt to surmise what history shall ultimately fashion out of current events and personalities. We are here to acknowledge a present debt. Fortunately, the men we honor today were abundantly recognized while they lived. They were honored in every possible way by this State Association which they did so much to upbuild. The honor we humbly proffer today is empty so far as any tangible commodity or token is concerned, but it comprises an evidence of love and affection that comes from the depths of our hearts. These men shall not be forgotten so long as our Association treasures loyalty to our guild and appreciation of Hippocratic traditions. The fact that we are here to voice these sentiments testifies clearly to the bereaved families, near relatives, professional associates and fellow townsmen, the deep sympathy that is ours and makes it unnecessary for me to mention my personal limitations in venturing to fittingly express your feelings.

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*Remarks made on the occasion of the Pilgrimage, October 27, 1939.

It was Talleyrand who said, "Speech was given to man wherewith to conceal his thoughts." World diplomacy today helps establish the correctness of that sordid implication. Faith between nations has reached an all time low. It is difficult to call to mind anywhere conditions, social and economic, wherein faith in each other is fully manifested by groups of men. Family respect and mutual dependence have been outmoded and liquidated in some countries. The idea of "Peace on earth, to men good will," by those who seek their bread through service is strangled by those who, blinded by hate, resolve to live through merciless force and oppression. It is fitting, therefore, and opportune, to call your attention to the possibilities of peace, faith and service, as exemplified in the open lives of the Mayos here in Rochester, Minnesota. The devotion of these two great men to their parents has been proverbial. The capacity they had to live as a unit—to converge their strength and superb faculties upon a common purpose—is phenomenal. So outstanding was their mutual devotion that Harvey Cushing (just deceased) recently wrote,* "Not since the somewhat mythical attachment of those Fifth Century physicians Cosmas and Damian, both of whom came in due time to be sanctified, has there been anything quite like it." Sorrowful though we may be . . . and would have been at whatever age they had passed . . . we cannot help but rejoice that these men who obtained so gloriously together in life were not long separated even by death. This circumstance of such outstanding complementary personalities, so richly endowed with genius, transcends everything else. Praise, adulation, honors, specific commendation and degrees—all have been heaped or conferred upon them in immeasurable degree, and yet, those who knew them may well feel that all these merits did not begin to measure their worth in terms of their neighborliness, citizenship and capacity for leadership. In the short space of time since their death scores of reviews for the various medical and surgical societies in which they had membership have been set up and spread upon minutes. Not a few have been published. These are at our disposal and for the comfort of the bereaved families. I choose to feel that this is not the occasion nor the circumstance either to repeat or catalogue what you all know. Rather do I prefer to discuss some of the manifold powers and attainments that have so conspicuously endeared "Will and Charlie" Mayo to their Minnesota confrères.

We must not be accused of immodesty or of fulminant local pride if we smile back at an admiring world as we proclaim: The men you honor were on our Minnesota team. You recognize their extraordinary talents through the medical literature they embellished, through the countless great from all nations who came to observe and wonder; through the great clinic they built up and the teaching institutions they endowed. But we, their neighbors, know what an "M" means in Minnesota. We feel they were the very first in Minnesota to deserve the letter. The alliterative euphony of Mayo, Minnesota, and Medicine, arises through one of the most fortuitous linkings of sturdy family name, environmental salubrity and vocational fitness any fairy godmother could devise. They truly and undisguisedly loved this state. They idealized its soil and even its climate. Whenever the occasion arose W. J. Mayo never failed to pay tribute to those hardy Minnesota pioneers, among whom his father stood out conspicuously. Others might be patronizing (as to the land or those who tilled it) in terms of its fertility and source of human sustenance, but it remained with C. H. Mayo, at the height of his technical fame and skill, to always announce himself as a farmer and to live on a Minnesota farm. I have known but one other man who shared with the Mayos such complete satisfaction with Minnesota as a habitation: no matter how bitter the winters or withering the summers it was all the same—Minnesota was everything—it was home. That other man was my father.

We lived on a farm three miles from Chatfield, about twenty-five miles from here. Among my earliest recollections is the circumstance of the illness of a neighbor, a Mrs. Keefe. In the spring of the year, when roads were quagmired, W. J. Mayo drove out to the Keefe farm, from the village, after coming down by train, to minister to her. Unfortunately memory fails me utterly as to the outcome of the illness of this good woman; but whether she lived or passed to her reward the fact that Doctor Mayo had visited her established in the consciousness of her family and the community the certainty that the utmost had been done for her. This local faith in the skill and integrity of the Mayo brothers was the factor that was destined to be extended to all who came from far and wide to develop alike their fame and their Clinic. Some doctors in later years, viewing the technical complexity of the Mayo Clinic, may have smiled when the Mayos spoke of having been "general practitioners," but I know that they knew full well whereof they spoke. When it comes to the matter of pride of birthplace, I hold it as one of my greatest involuntary achievements—I was born in Olmsted County, and the Minnesota Medical Mecca is its County Seat! With all the rest of you who entered Medicine in Minnesota in my medical generation, that began practice the first decade of this century, we witnessed, step by step, the magical development of this center of medical practice and teaching. The popular account of early development places justifiable emphasis upon the circumstance of the early cyclone and the need of facilities for the injured. That was important, but there was a lot of much more subtle spade work done that only doctors who ever attempted to organize complete medical service may well appreciate. I was told by one of the brothers years ago that with their earliest abdominal surgery, so intent were they upon a safe convalescence, that one or the other frequently remained in the hospital overnight, where in the absence of any semblance of an interne service, and with only a few, overworked nurses, they met every emergency. There was no such thing as "passing the buck"—there was no one to receive it.

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*Cushing, Harvey: The Mayo Brothers and Their Clinic, Science, 90:225, (Sept. 8, 1939).

If I mention a few of the personal factors that betokened the genius of the Mayo brothers I do not wish to imply that I knew them intimately. While on many occasions I had their personal recognition, I may simply state that I shared their confidence in no greater degree than did all of you who knew them at all. A word of praise here; a commendatory note there. The busiest of men, they never seemed too occupied to notice people. We were all invited to come here whenever we could. Every convenience and much personal hospitality were at our disposal. We began to profit early by the example of this rapidly developing miracle in the organization of medical and surgical service. And what an inspiration it was to come here and visit! Our Minnesota profession became one of the most alert and qualified among all our states. The competition that the fearful and suspicious might surmise and suspect, found a Minnesota profession equal to it. It was and is a profound stimulus. We have all had to be better doctors. The example offered here in daily practice, the research activities so freely publicised, the developing specialties, the skill of staff member presentations at medical meetings, the willingness to travel widely to relatively small Society groups, their publications—all helped attune our profession to the medical progress of the world at a time when Medicine was advancing by leaps and bounds. Medicine was certainly on the march, and it required genius, as well as humility, to realize its possibilities, to sense its imperfections, and acquire a technic to keep abreast of the times. The Mayos early learned how to do it.

The Mayos became the foremost medical travelers of all times. So far as I know, no one has previously made that formal statement. Long before they trekked outside our state they made regular visits to see the late Charles Wheaton and other distinguished Twin City colleagues. They were ever willing to learn from the men in this locality, such as Staples and McGaughey of Winona, and Andrews of Mankato. Their restless zeal to advance knowledge as well as technic led them to all the surgical centers of our country, and later abroad. They especially admired Deaver of Philadelphia and Murphy of Chicago; they loved Ochsner. It was a liberal education in itself to hear them tell of their travels and quote the distinguished surgeons of their day. No formal lectures, exhibitions or clinics, here or abroad, ever inspired me as much as the affable, impromptu remarks they made to us "visiting firemen" sprawled over the gas pipe bleachers. The heavy bushy eyebrows signalled the smile of recognition the face masks could not conceal. Much medical wisdom and selective practical philosophy emanated from these surgical theatre colloquies. It is obvious to all those who knew them that these two men were quite different; but each had his own way of exhibiting his wisdom and understanding. Their methods were never brusque, the humor coarse, the attitude critical, or their purposes demeaning. From this operating room contact alone one might sense the universality of their minds, the current medical and surgical trend, the freedom from cant, and grateful recognition of all those of like spirit around the world from whom they were so willing to learn. Is it any wonder then that Rochester became the medical crossroads of the world; that our Minnesota interests became world-wide, and the Clinic and hospitals spread apace over their foundations.

The Mayo Clinic grew because the faith the brothers had in each other was extended to a brilliant sequence of men and women whom they led into their confidence as well as their organization. The consolidating influence of family name was never ignored but the fatal blight of nepotism has always been averted. Need I mention the scores of men and women they sponsored—those whose talents became so closely knit to their own that cleavage never obscured or marred the ultimate purposes and objectives. To illustrate my meaning, permit me to refer to the cleverness of some early hands that worked more or less unseen and voices that contributed heavily to the medical melody that was to become symphonic. It was indeed a truly inspired chorus of doctors. There was M. C. Millett, a native of nearby Dover, Minnesota, who worked for years in the basement of old St. Mary's Hospital, and pioneered so fruitfully the diagnostic genito-urinary work, later brilliantly expanded by Braasch and his associates. Then, there was E. K. Beckman, who came down here from the superintendency of the Minneapolis City Hospital and in a short time became conspicuous for the surgery of the central nervous system that Adson and his associates have so much advanced. The incomparably gifted Henry Plummer was a local Minnesota boy whom W. J. Mayo noticed because he was dickering around with a microscope and wanted to know about things. He was perhaps the most original and creative mind the Clinic ever helped to develop. This building is his monument and this beautifully appointed room bears his name. E. Starr Judd is buried here, with his illustrious preceptors, in the city of his birth. Here he rests eternally from the labors he superhumanly assumed. His were the first skilled hands that joined with the Mayos to carry the surgical load, and to advance technical and diagnostic achievement. Two very gifted internists, Charles Stanley McVicar and George Brown, died here long before they had time to fulfil their brilliant promise. R. D. Carman brought to the Clinic and developed the priceless boon of gastro-intestinal fluoroscopy. He died of the disease he helped so many others to uncover. Obviously, these names, chosen at random, do not comprise the list. But all of them, those who have retired, like Louis B. Wilson, and the various members of the active staff, its business and personnel officers and attendants . . . each and all, in their time, fell under the spell of the great leaders. First, last and all the time, the staff members were taught by example and by word of mouth to have faith in each other. Antagonisms and animosities, that have so much interfered with the lives of doctors of all times, were here minimized. Witness, within the historical period, the belligerent, stormy lives led by such men as Semmelweis and John Hunter: the one driven to insanity and despair, the other to furious excesses. The approval, consideration and support both needed so much never came. Recall the squabbles attendant upon early Revolutionary War Period Medicine in Philadelphia. What a wastage of fellowship and energy abounds in most communities, even today. How purposeless personal bitterness, born of competitive zeal, has always been, and to what an extent internecine quarrels have alienated the public. Here we have an objective evidence of the possibilities accruing to doctors who stick to their profession, have faith in their immediate confrères, and an understanding of the possibilities of public service.

They never started out to develop this plant. Each day, each month, each year, came with its multiplying duties as well as opportunities. Each of us in our own small sphere should remember this. The type of development witnessed here is never going to be repeated anywhere. If one could obtain a cross-section of the Mayo Brothers' minds at any fixed time he likely would have found there as much surprise at the extent of medical growth in Rochester as any outsider might voice. W. J. Mayo told me, on the occasion of the opening of the first Clinic building sometime about 1913, "Tuohy, no one but a bunch of fool doctors would build anything like this." There was a wealth of pride in his tone. Not long after that C. H. Mayo wrote, "I don't seem to be able to get into my office—somebody seems always to get there first." What I am groping to say is that a group of hands and alert minds began to coördinate in Medicine as they never did before. They did so under the ægis and guidance of two versatile and gifted geniuses, to whose memory we come today to pay tribute. It is not for us to say that public institutions, however guided and financed, may not sometimes accomplish comparably; but those who think so have a greater optimism than most of us share.

It has been said that the Mayos would have been among our first citizens in whatever field they developed. However, pride in our own profession entitles us to the belief that Medicine gave their genius marvelous scope. They were successful because they sensed true values, and had the physical and mental powers to capitalize upon the period in which they lived. It was, indeed, a great expanding era for this Middle West. They became a part of it. They were, therefore, happy because they found themselves. They led blameless, busy lives. More than any other men of their period, they popularized Medicine. They made people feel that doctoring was a worthy vocation and that skills could usually meet and vanquish ills; in the face of defeatist disease forms, life could be prolonged and comfort promoted. Doctors flocked here with their families for professional service. The clergy of all denominations came likewise. Their gifts of personal service over and above that traditional with all physicians mounted as did their reputations. A great many of you here today, I am sure, would wish to voice with me the profoundest thanks and appreciation for life saving medical and surgical service rendered to those near and dear to us.

I have stressed at some length the matter of the value of faith, which the fruitful lives of these men illustrated. I must not overlook the faith of the Sisters who from the beginning and the pioneering of W. W. Mayo did so much to develop hospital service. Faith is like Justice, Truth or Beauty. It derives from infinite sources, and insofar as man exemplifies these abstractions he exhibits through his creative genius his eternal relationships. Therefore, in stressing faith in the development of the Mayo Clinic, it is more than fitting that we also pay tribute to that foremost and gifted surgical assistant, the late Sister Mary Joseph.* Her life, industry, devotion and forthrightness typified beyond any power of mine to describe the divine spark of service that these great religious orders have bestowed upon the art of nursing and the development of hospitals. Man without food and drink would be no more handicapped than medical science without hospitals.

The lessons we should retain from the lives of these men are obvious. A heavy task looms ahead of our guild. Our service has become complicated and expensive. The period of acclaim for our attainments is waning. The belligerent phase is with us characterized by whining importunates who feel that wishful thinking may provide (without effort or work) both necessities and security. We face this situation with many in our guild voicing the sentiments of Columbus' crew: "They would like to turn back." The tempo of progress and the tradition of service established here at Rochester are not going to be easily maintained. In a war-torn world it is unfair to assume that any country is at peace or will long remain so. Political strife abounds even where military exploitation stops short of killing. The Mayos had unusual capacity for avoiding political entanglements. Witness the very long service of W. J. Mayo on the University Board of Regents—admired, respected and beloved by everyone, and trusted by all political parties. If time permitted, I could recount in adequate detail an illuminating experience when the University Medical School in Minneapolis was about to expand to the river bank across Washington Avenue. There was much opposition on the part of certain other departments within the University. I was one of a committee of medical alumni chosen to present to the late President Northrop our appeal for this expansion. John Lind, then at his prime, was on the Board of Regents, and voiced considerable nettlesomeness that we should ask so much. President Northrop had evidently had much argument poured into his ears, and he likewise demurred. After everyone else had spoken, W. J. Mayo was asked to express himself. The master spoke. In a very few words he settled the whole issue. He condemned no critic of the plan, but simply stated that there was nothing else for the University to do. Medical education had taken on a position in our national life where the second best was unthinkable. It had assumed the entire function in Minnesota of medical education, and the best position on the campus belonged to the Medical School by right of its primary service to the State and its people. There was no more said about it, and you know where the Medical School buildings were placed. It was perfectly clear that he had amazing gifts of leadership. In a country destined to be torn by partisan voting blocs, these brothers always understood the common man, and lacked that obtuseness that maneuvers to keep him "down the wind." They did not despise wealth, but sought it for what it would do rather than the social position it might bestow. Charles M. Schwab (recently deceased) thus spoke to the press on his recent return from Europe when asked about his wealth: "The mansions I owned came to own me." The Mayos long antedated the steel magnate in this discovery, and you know what they did with their private wealth. It is worth commenting upon how conspicuously doctors illustrate the fallacy of "trying to make a financial killing." The attempt made here to provide adequate financial emolument to "many medical men of many minds," is an achievement in itself that should be recorded in history. They were proud of the plan of insurance and retirement they helped devise for the staff members and hoped that financial worries (so prevalent among all professional folk) would not divert energies away from the problems of doctoring or prostitute ethical concepts when confronted with speculative disaster. God forbid that deflating political crusaders may proceed to make all saving absurd.

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*It was a very fitting coincidence that on the very day this Pilgrimage was held the Franciscan Sisters celebrated the 50th Anniversary of the Founding of St. Mary's Hospital. The exercises were attended by many who came for the Pilgrimage. Dr. C. W. Mayo presided. A number of addresses were given by visiting prelates and Rev. Father Schwitalla brought a message from the Catholic Hospital Association. Dr. Louis B. Wilson spoke with great charm and forthrightness concerning the early pioneer Sisters in nursing.

Many attending here today are of the Alumni of the Mayo Foundation Fellowships. You know what the munificence and foresight of the Mayos have meant to you, and yet your indebtedness to this institution only varies in degree, because of your closer contact, with that of us in Minnesota on the outside who have had long and pleasant association with the men who taught you. A recent book reviewer has alluded to Yandell Henderson as "showing the working of a vigorous and imaginative mind—the mind of a physiologist who boldly applied his newly learned knowledge to important practical problems in Industry and Medicine, and achieved remarkable success." What the reviewer said of Henderson applies doubly to men like Thomas Edison, the Wright Brothers, Alexander Graham Bell, Henry Ford and the brothers Mayo. They turned science to very practical purposes and thus gave to the toiling masses an opportunity to look up at the stars—and live. The Mayo Clinic, The Foundation, and the Experimental Farm, the affiliation with the University of Minnesota—all have aimed to synchronize research with the actual practice of Medicine. Where-ever you live and whatever associations you make, I am sure you are attempting to advance and elevate the standards of medical practice, and to promote understanding among your fellows. You were taught here much concerning specific methods. Scientific advance will make much of what you learned obsolete. Some diseases and indications will fade out of practice. That which will never fade, is the example and manner of life you have been privileged to observe. We live in a world flooded with falsehoods and propagandized with every virus of hatred, and yet, we must not doubt. An English geologist* has recently written a paragraph which plaintively sketches a hope of what unfettered science could accomplish. Here in cloistered Rochester I feel we actually see it. Here are his words: "The mere existence of a company of people declaring their interest in matters bigger than the squabbles of the political nursery, preferring to contemplate wider problems and vistas than those of the daily headline, should be enough to insure a nucleus of stability in the quicksands of opportunism."

We shall shortly go over to the spot where William James and Charles Horace lie buried; there to place wreaths over their graves. They have returned to the peaceful earth they loved so well. To doubt the future of Medicine at this time is to sin against the faith of our fathers. "Magnus est veritas† et prevalebit."

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*Hawkins, Herbert L.: Science, 90:261, (Sept. 22) 1939.

†It is significant and worthy of mention that the above lines were written before the opportunity had come to me to read the inscription on the tomb of William James Mayo. Those who pause to read it may sense some of the surprise that came to me as I read, "He loved the Truth, and sought to know it."—E.L.T.

TRIBUTES GIVEN AT THE GRAVES OF DR. CHARLES H. MAYO AND DR. WILLIAM J. MAYO, OCTOBER 27, 1939

CHARLES W. MORE, M.D.

Eveleth, Minnesota

WE ARE gathered here to honor two great men, Drs. William J. Mayo and Charles H. Mayo.

I am greatly honored to be asked to place this wreath in memory of my classmate, Dr. Charles Horace Mayo. What can I say about him that you do not already know?

He became known, loved, honored and respected over the civilized world, not only for his medical, surgical and scientific contributions, but for his wonderful personality, his friendly, generous, reliable and noble qualifications as a man. He was not given to pretense.

As a medical student, he was earnest, sincere and congenial, attended the lectures regularly and came prepared to answer when called upon by his teachers and showed his desire to learn and be taught. This faculty he retained through his long and useful life.

The past fifty years represents the approximate period of development of the Mayo Clinic.

As we stand here commemorating the faithful and self-sacrificing service of these men, Dr. William J. Mayo and Dr. Charles H. Mayo, whom we loved and respected and who did so much to advance our profession, I wish to acknowledge the great privilege it has been to know and honor them through these years.

ARNOLD SCHWYZER, M.D.

Saint Paul, Minnesota

MEMBERS of the Minnesota State Medical Society, Friends: We have come out here to thank these two great men once more for all they have done for science, for mankind and for us in particular. Your committee asked me to place this wreath on Dr. Will's grave, as I have known him perhaps longer than most of you. I had the good fortune to become acquainted with him already in the early nineties when he often attended the meetings of the Minnesota Academy of Medicine. His keen eye, his sane practical views on any subject he discussed and, as I well remember, his eagerness for any possible improvement to be found in surgical measures would strike you at once, and no less than his distinguished personality.

Toward his colleagues he was a model of fairness and loyalty. I had my own lesson from him one day. Speaking of a well known surgeon whose publication in French on carcinoma of the stomach we had read together on a visit of mine down here, I told him of a remark this man had once made in his clinic, which sounded like a somewhat supercilious attitude toward our American surgery. This was forty years ago. A complete silence and a stony face were a well remembered lesson I received for readiness with poorly founded criticism. Such fairness toward others and his readiness to give credit to others was easily recognized as due to his own serene greatness and the immaculate cleanness of his personality. Thus to mention just one incident. When describing a greatly improved method of handling a certain difficult problem he told us that the different steps were like flowers he had gathered from the research of others and his was only the ribbon with which he had tied the bouquet together. One of his great traits was a quick and sure judgment of others. This is one of the most important qualities in a man when building up a gigantic institution as the Mayo Clinic has become. He knew how to find and size up worthy and outstanding associates.

So many factors were necessary for the building up of an institution of such dimensions, factors of which many of us have probably never even dreamt. If I speak here of Dr. Will we all know that Dr. Charlie is included with a full and equal share in everything. In fact I could see Dr. Will frown if Dr. Charlie were not given at least a good half of all the credit. But I am helped out of this dilemma of being supposed to speak mainly of Dr. Will by Dr. Charlie himself. In my mind I can see him standing right here and with his bewitching smile give me a kindly wink never to mind and to go right on.

Such was their brotherly devotion, wonderful. None of us would hesitate to call it simply ideal.

These two, in unspotted harmony, worked together —one can well say—day and night, when with the growth of the clinic the responsibilities and manifold duties multiplied, in geometric proportions. Thus for instance, even at lunch time, while Dr. Will's guests conversed among themselves, he had his secretary by his side and letter after letter was disposed of, stacks of them. Just the same, he took notice of the trend of the conversation and would often interject some observation or reminiscence. And while it was work, work, work on all sides he kept a mental and psychic equilibrium which was wholly incomprehensible for me and is only possible in a giant.

Can you imagine how many times he had to set aside personal comfort? He was complete master over himself and nothing could divert his inner eye from his goal, their goal.

We all felt already early in their careers that these two brothers were to be leading surgeons, but who could have imagined that the world would some day see an institution of such renown and glory? If you consider that it was really their great father who started them on their road, their father whom they worshipped and who lies here between them, you are reminded of the Asklepieion of the old classic Greek days where armies of the sick arrived from all sides. Homer tells us that in the healing of wounds Asklepios and his two sons were the most outstanding experts in the whole country.

The world has recognized these two brothers as stars of first magnitude. We, of Minnesota, who had the good fortune to come into personal contact with them, retain a deep gratitude for what we received from them. We not only profoundly respected them and were proud of them, we loved them in reverence; and we keep on loving them. Doctors Will and Charlie, what endearing names! For us they will always remain Dr. Will and Dr. Charlie. The one can never be mentioned without thinking of the other in the same spirit. Their unique harmony and brotherly love unites them into a picture which—bright and glorious—will remain in our hearts to the day of our own end. Their spirit remains with us. They are and remain ours.

(Placing of wreaths)

Friends, Dr. More and I should have liked on this occasion to speak of the great and often repeated kindness and thoughtfulness toward us personally, but so many are present here who undoubtedly feel the same way and who had the same experience. We must therefore give them mute thanks with our hearts. Let us, before leaving this sacred place, remain here for a moment in silence.

WOMEN'S AUXILIARY

Mrs. A. C. Baker, Fergus Falls, *President*
Mrs. E. V. Goltz, 2259 Summit Avenue,
Saint Paul, *Publicity Chairman*

STATE BOARD MEETING

Members of the State Board of the Women's Auxiliary to the Minnesota State Medical Association held their first meeting of the year Thursday, October 12, in the Women's City Club, Saint Paul. Mrs. C. C. Chatterton of Saint Paul was the social chairman. The business meeting, which began at 10 a. m., was presided over by the state president, Mrs. A. C. Baker of Fergus Falls. Mrs. R. J. Joweski of Stillwater, recording secretary, read the report of the June convention which was held in Minneapolis. The Public Relations chairman, Mrs. A. F. Branta of Willmar, presented plans for the coming year. Other reports were heard from Mrs. M. A. Nicholson, president-elect and organization chairman; Mrs. S. S. Hesselgrave of Saint Paul, Archives chairman; Mrs. W. W. Will of Bertha, who reported on Hygeia; Mrs. J. A. Thabes, Sr., of Brainerd, Health Education; and Mrs. Joseph Gaida of St. Cloud, the state historian.

The following county presidents were present and gave reports: Mrs. E. Mariette, Hennepin County; Mrs. Harry Ghent, Ramsey County; Mrs. J. S. Cosgriff, Renville County; Mrs. Neil S. Dungay, Rice County; Mrs. Thomas Young, St. Louis County; Mrs. T. N. Flemming, Stearns-Benton; and Mrs. E. S. Boleyn, Washington County.

At a luncheon following the meeting Dr. W. A. Coventry of Duluth was the guest speaker. Thirty-two members were in attendance.

Hennepin County

Members of the Philanthropic Committee of the Women's Auxiliary to the Hennepin County Medical Society, who are making plans for the annual sale of articles for the tuberculous patients at Glen Lake Sanatorium, are Mrs. W. F. McGandy, Mrs. A. L. Hamel, Mrs. H. B. Sweetser, Mrs. R. F. Erickson, Mrs. Walter H. Fink and Mrs. F. B. Mach. The entire proceeds of the sale are returned to the patients who make the articles. The sale was held November 16, 17, and 18 at Dayton's.

Ramsey County

The Women's Auxiliary to the Ramsey County Medical Society held its first meeting of the season Monday, October 23, at the country home of Dr. and Mrs. A. Hoff, Turtle Lake. Mrs. Harry Ghent, the president, presided. After a short business meeting, a talk on "Bells" was given by Mrs. Schuyler Woodhull of Minneapolis. A social hour followed and tea was served.

Mrs. E. M. Hammes, Mrs. H. P. Ritchie and Mrs. Edward Schons, former presidents of the Minnesota State Medical Auxiliary, and Mrs. W. H. Hengstler and Mrs. A. E. Nichols, past presidents of the Ramsey County Medical Auxiliary, presided at the tea table.

Newly elected officers of the Ramsey County Medical Auxiliary are: President, Mrs. C. Harry Ghent; president-elect, Mrs. L. G. Dack; vice president, Mrs. F. J. Plondke; second vice president, Mrs. R. B. Schoch; recording secretary, Mrs. C. W. Waas; corresponding secretary, Mrs. J. Allan Wilson; treasurer, Mrs. Mark E. Ryan; auditor, Mrs. A. E. Nichols.

The Ways and Means Committee of the Ramsey County Medical Auxiliary gave a buffet dinner at the Lowry Hotel Grand Ballroom on Monday evening, November 20, for husbands and guests. Members of the cast in "The Dream of a Clown," the musical revue which the Auxiliary sponsored last December, also attended the dinner. A surprise program in the form of an all male cabaret offered great amusement to those present.

The Ramsey County Medical Auxiliary has recently paid for the remodeling and redecorating of the kitchen at the Children's Home Society, a non-sectarian home for under-privileged children in Saint Paul.

Washington County

The Washington County Medical Auxiliary met at the home of Mrs. J. M. Haines on Tuesday, October 10. The afternoon was devoted to business, sociability and sewing for the Lake View Memorial Hospital. There were twelve members present.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
W. F. Braasch, M.D., Chairman

A NEW AUXILIARY TO MEDICAL PROGRESS

Organized medicine assailed by federal authorities and social reformers is so situated that it is difficult to defend itself. Continued propaganda by these powerful opponents has undoubtedly had its effect on a considerable element of our population.

We physicians realize that the position of American Medicine needs no defense and if left alone that we could solve the problems of medical distribution. We believe that we have the confidence of most of the intelligent and informed members of society. Nevertheless, there is a determined movement on foot, largely political, which threatens to wrest control of medical care from our hands and place it under federal influence.

Combining Forces

The American Medical Association cannot organize its forces to fight back; it has neither the funds nor can it employ methods necessary to contend successfully with its opponents.

In order to carry on it has become necessary to form an auxiliary body, including a group of influential laymen and interested friends of medicine. With the active support of their combined forces and the financial aid of this group, it is hoped that American Medicine can defend its independence and continue its march of progress.

For Supportive Action

The new institution which has been formed will be known as the *National Physicians' Committee for the Extension of Medical Service.* Its officers and the members of the Executive and Central Committees are men who have long been associated in the loyal support of the American Medical Association. The objectives are in no way antagonistic to or critical of the policies of the American Medical Association. In fact, its function is purely to preserve a supportive line of action which the parent organization cannot assume. It will take over many of the activities of the old Gannett Subcommittee for Free Enterprise in Medicine, which accomplished so much in the opposition to the late lamented Wagner Health Bill.

Objectives

The objectives of the new committee are as follows:

1. To make the public thoroughly familiar with the glorious record and achievements of American Medicine;
2. To provide for the widest possible distribution of efficient medical care;
3. To prevent the adoption of new Health Bills embodying federal control of medical care which appear to be imminent in the next Congress, and
4. To insist on coöperation with the medical profession in the distribution of federal funds which may be justified by local needs of medical care.

Minnesota to Assist

A National Committee is being organized in Minnesota and members of our State Medical Association will be asked to support its activities. —W.F.B.

WAR AND MEDICINE

Now that the neutrality bill is on the statute books and the sound of European guns is somewhat less deafening in official ears, will the Wagner bill assume its former importance on the Washington stage?

Answers to that question differ somewhat depending upon the source of information.

It is of interest to note that administration officials, including Secretary-of-Labor Perkins, omitted no opportunity to point to a distressing lack of health facilities and medical care in the United States for the benefit of state and provincial health officers who met in Washington recently. Secretary Perkins herself was clearly interested in the establishment of medical service as one of the Social Security Aids. Another amendment providing for it appeared certain to be introduced in the next Congress.

Congress Pre-occupied

Other reports from sources quite close to congressional leaders in both houses of Congress indicate that the Wagner bill or a similar measure would undoubtedly pass both houses if it could be put to a vote now. Most of the senators and congressmen believe there is a need for it, according to this report. Other things being equal, they would undoubtedly vote for a sweeping health bill.

But all other things are not equal. It is more than likely, according to this prediction, that Congress will continue to be pre-occupied with international problems and America's precarious neutrality. That being the case, it is going to be difficult to get attention for any internal program and there will be small interest and less enthusiasm for any radical departure from the present Social Security act.

Emergency Dictatorship?

One possibility is sensed by all who visit Washington. If the United States should be drawn into war—and returning congressmen do not dismiss that possibility lightly—then medicine will be one of the first departments of civil life to be subjected to emergency dictatorship. Members of the Medical Reserve Corps and all of the younger physicians will be conscripted for war service. Medical services at home will be proportionately demoralized and those who remain will be under emergency orders to go where they are needed most.

The dislocation of medical services will be far greater in case of a new war than it was in 1917 because War Department plans for the draft are said to be far more complete and far reaching. They will, in all probability, be put into effect immediately. The effect upon civilian services will be equally immediate and disastrous, unless the government steps in.

The question is: will the government step out? To some observers, it seems unlikely that physicians will regain complete freedom of practice when the emergency is over.

In any case, there are no ready made answers to the questions that the current crisis will present to the world. One thing alone is certain: Alertness and levelheaded leadership are needed among American doctors.

FARM SECURITY PLAN REJECTED IN WRIGHT COUNTY

Adequate facilities are available for medical care of Farm Security Administration clients in Wright County under the existing plan for medical care of relief clients. There is no need at present for a coöperative contract, so-called, to be financed by the Farm Security Administration for these Wright county clients.

This decision was recently reached by the Wright County Medical Society after extensive and careful consideration of a proposal for such a plan made by Administration representatives in Wright County.

In considering the proposal, the county medical society was, of course, free to make its own decision, basing its findings solely upon conditions in its own community. The Sub-Committee on Low Income and Indigent Problems of the state medical association's Medical Economics Committee had previously considered advisability of similar contracts from a state-wide point of view and had concluded that no need exists at the present time for a state-wide plan for Farm Security Clients; but the action of the state committee is not binding upon individual counties which may wish to organize, providing the plan is ethical and meets with the approval of the local county medical society.

No Definite Need

Wright County findings were as follows:

1. That no definite need was established for such a plan in Wright County.

2. The doubtful number of clients that could be interested in such a plan.
3. Small number of clients in Wright County, even if all should become interested in the plan.
4. County Society members are satisfied with the present set-up for care of poor within the county at this time.
5. That all inquiry and evidence indicated that all poor within the county, applying for medical or surgical service, received it through the present available sources, or gratuitously by members of the County Society.
6. That the plans advanced, indicated an increase of book work, and keeping of records and making of reports, out of all proportion to any benefit that might be expected in the way of increased income or betterment of service to clients.

PHYSICIANS WILL APPLAUD

If the state and territorial health officers are heeded, any future expansion of tax supported Industrial Hygiene services will be developed in a manner to provide immediate or ultimate responsibility for direction of the program by the State Departments of Health in coöperation with the United States Public Health Service.

A resolution to this effect was passed during recent deliberations in Washington of the health officers' association. It was the response of the health officers to pressure brought from time to time to remove Industrial Hygiene from health department auspices and give to the Department of Labor.

All physicians will applaud retention of the Industrial Hygiene program with the regular official health services of each state. Emphasis will thus continue to be placed upon scientific investigation under qualified direction and also upon coöperation with practicing physicians.

"Proof of Death"

The health officers also approved the plan submitted by the Social Security Board which calls for the local registrar, or other person authorized under state law or under regulations of the State Department of Health to receive certificates of death, to send each "proof of death" direct to the Social Security Board. The importance of this action arises from the fact that without such proofs of death benefit payments will continue to be paid after holders of Social Security account numbers are deceased. It is expected that a large part of the population will eventually hold Social Security numbers and each death will be reported immediately to the Social Security Board.

LET IT BE RESOLVED

(Monthly Editorial Prepared by the Medical Advisory Committee)

The year 1939 has been a most interesting one in the work of your Medical Advisory Committee. Unusual cases have brought unusual situations in certain localities in the state. They have affected doctors in their attitude toward each other, toward lawyers in compensation and other insurance-involved litigation, toward political and state subdivisions attempting to control medical care.

With 1940 in the offing, would it not be well for each man in our Association to ask himself a few questions like the following:

1. Have I in any way by act or deed started a malpractice case against a fellow practitioner?
2. Have I practiced the same consistent and honest medicine and surgery that I would have wanted to be used on a member of my own family under the same circumstances?
3. Have I connived with any legal advisor for the purpose of putting over a case contrary to the ethics of the A.M.A. and good medical practice?
4. Have I in court given unbiased and fair opinions when called as a witness, thereby gaining the admiration and good will of the court?
5. And last, have I at all times held the well being of the whole medical profession paramount to my individual desires?

When these questions have been honestly answered, let us begin the new year with a resolution to put American medicine on a higher plane than ever before.

Your Committee believes thoroughly that the evils within the profession can be most easily eliminated by consistent work with individuals.

B. J. B.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Julian F. Dubois, M.D., Secretary

Saint Paul Representative of Viavi Products Convicted by Jury of Practicing Healing Without Basic Science Certificate

Re. State of Minnesota vs. Ruth A. C. Sherman.
Re. State of Minnesota vs. Anna E. Miller and Ruth A. Sherman.
Re. St. Paul Viavi Company.

A jury in the District Court of Ramsey County, on October 27, 1939, convicted Ruth A. C. Sherman, 63 years of age, of the crime of practicing healing without a basic science certificate. Mrs. Sherman, manager of the St. Paul Viavi Company, had been indicted by the grand jury of Ramsey County on October 9, 1939, on a charge of violating the basic science law in connection with the sale of Viavi products totaling $32.25, to one Edward Farrell of St. Paul, who was suffering from a detached retina. The trial commenced on October 23, and the case was submitted to the jury at 6:30 p. m. on October 27. The jury retired for dinner and returned with their verdict at 10:15 p. m., deliberating less than two hours before finding the defendant guilty. The jury was composed of four women and eight men. Sentence was pronounced on October 30, 1939, by the Honorable Gustavus Loevinger, Judge of the District Court, who presided at the trial, and in imposing sentence sharply denounced the sale of Viavi products as a menace to the community and an imposition on the public. Judge Loevinger also pointed out that the evidence clearly indicated that Viavi products, while being sold for large sums of money, were worth only a mere fraction of their sales price, and in addition were of doubtful value. Judge Loevinger upon being assured by Mrs. Sherman, in open court, through her legal counsel, Mr. Carl W. Cummins and Mr. Frank Drill, that Mrs. Sherman would refrain, in every manner, from the sale of Viavi products in the State of Minnesota, imposed a sentence of three months in the Women's Reformatory at Shakopee, Minnesota, and placed the defendant on probation for one year under the supervision of Mr. John Doyle, probation officer for Ramsey County. Counsel for the defendant made a plea to the Court to impose a fine instead of a jail sentence, but his plea was successfully opposed by Mr. James F. Lynch, County Attorney, on the grounds that imposing a fine would enable the Viavi Company in Chicago or San Francisco to pay the fine and the defendant to remain in the Viavi business.

At the same session of Court, Anna E. Miller, 55 years of age, who also engaged in the sale of Viavi products in St. Paul, entered a plea of guilty to an information charging her with the crime of practicing healing without a basic science certificate in connection with the sale of Viavi products, and upon similar assurance being given to the Court that the defendant, Miller, would disassociate herself entirely from Viavi products, was sentenced to a term of one month in the Women's Reformatory at Shakopee, and was likewise placed upon probation for one year under similar terms. It was brought out in the questioning of the defendant, Miller, that she and the defendant, Sherman, had obtained in excess of $800.00 from one St. Paul family, over a period of years, for Viavi products.

Defendants, Sherman and Miller, were arrested on June 15, 1939, by detectives of the St. Paul Police Department following the signing of a complaint against the defendants by Mr. Brist on behalf of the Minnesota State Board of Medical Examiners. Through the splendid coöperation of Mr. R. A. Trovaten, Commissioner of the State Department of Agriculture, Dairy and Food, and Mr. Henry J. Hoffman, chemist, and Mr. W. C. Johnson, assistant chemist in the chemical laboratory of that Department, the attention of the Minnesota State Board of Medical Examiners was called, on June 13, 1939, to the obtaining of $390.70 by the defendants, Sherman and Miller, for Viavi products, from Mr. and Mrs. William Arndt and their daughter, who reside at 1538 Thomas St., St. Paul. The Arndts, upon the representation made by the defendant, Miller, that these Viavi products would restore the health of Mrs. Arndt and the daughter, paid this large sum of money to the defendant, Miller, who in turn secured the products from the defendant, Sherman. After faithfully following the directions given by the defendants, for nearly one year, the Arndts became discouraged because of no improvement in their health, and took the Viavi products consisting of Viavi Royal Tonic, Viavi Cerate and Viavi Tablets, to the chemical laboratory of the State Department of Agriculture, Dairy and Food, for a chemical analysis. Messrs. Trovatten, Hoffman and Johnson, upon learning of the large sum of money paid by the Arndts for such a small amount of medicine, promptly referred the matter to the Minnesota State Board of Medical Examiners for an investigation, leading to the arrest of both women two days later. Following their arrest, both defendants demanded a preliminary hearing, which was held on July 7, 1939, before Judge Robert V. Rensch, recently appointed by Governor Stassen to the Municipal Court of St. Paul. The evidence at the preliminary hearing disclosed that of the $390.70 obtained from the Arndt family, one-third, or $130.23, went to the defendant, Miller, one-third, or $130.23 went to the defendant, Sherman, and a like amount to the Eastern Viavi Company at Chicago, Illinois, from whom Mrs. Sherman obtained the Viavi products. At the conclusion of the preliminary hearing Judge Rensch denied a motion by counsel for the defendants to dismiss the cases and emphatically stated that the Court could not possibly dismiss the cases in view of the testimony by the Arndt family and held both defendants to the District Court under bond of $1,000.00 each.

At the trial in the District Court of the defendant, Sherman, the State introduced evidence that Mrs. Sherman represented Viavi as "the means of restoring health." One of her professional cards appearing below:

302 Oppenheim Bldg. St. Paul, Minn.
VIAVI
THE MEANS OF RESTORING HEALTH
R. A. C. SHERMAN FOR APPOINTMENT
GEN. MGR. TEL. CE. 8952—MI. 3986

In addition to the Farrell case, the State introduced evidence to show that Mrs. Sherman had made similar representations to other persons who were sick, and that she had obtained various sums of money for Viavi products. One witness testified that Mrs. Sherman had represented to him and his wife, that Viavi products would cure his wife of heart trouble and that they purchased Viavi products to the extent of $64.05. This witness also testified that his wife died in May of this year, notwithstanding the Viavi products. Another witness testified for the State that he had paid Mrs. Sherman nearly $50.00 for Viavi products for his daughter who was suffering from chronic bronchitis. It is interesting to note that at the trial, one Dr. Robert E. Law, 51 years of age, testified as a witness for the defendant, Sherman, and stated that he was a graduate physician and surgeon, and that he was vice president of the Viavi Company at San Francisco, California. While this witness was on the stand, he admitted upon cross examination that the United States Government had seized a shipment of Viavi products in the State of Colorado, and that the Government had sued out a libel proceeding in the United States District Court, alleging that the labeling of the products contained statements representing that the products possessed curative and therapeutic properties which, in fact, they did not possess. It was also disclosed that on May 19, 1932, a United States District Court Judge, in Colorado, made an order for the condemnation and forfeiture of the Viavi products and ordered that they be destroyed by the United States Marshal. Dr. Law also testified that the active head of the Viavi Company at San Francisco is his father, Dr. Hartland Law, whose age he gave as 81. The Court was also advised that a representative of the Eastern Viavi Company of Chicago, Illinois, was in the court room throughout the trial. The records of the St. Paul Viavi Company disclosed that in the month of January, 1939, Viavi products totaling $650.00 were sold through that office and varying amounts for other months. It was also brought out that the Viavi Company has a representative in Minneapolis and also in Duluth.

While the Minnesota State Board of Medical Examiners is proud of the small part that it played in these cases, it feels that the major credit for the splendid results achieved, is due to the most capable handling of the cases by Mr. James F. Lynch, newly appointed County Attorney of Ramsey County, and the most serious and patient consideration given to the cases by the grand jury of Ramsey County, Judge Gustavus Loevinger, who presided at the trial, and the trial jury. Judge Loevinger publicly commended the grand jury, the trial jury and Mr. Lynch for what they did in these cases, and the Medical Board wishes to join in that commendation, and also to acknowledge the prompt and worth while coöperation of Messrs. Trovatten, Hoffmann and Johnson.

Court Dismisses Suit by Austin Physician and Fraternal Order of Eagles Against the Minnesota State Board of Medical Examiners

Re: Fisch, et al. vs. Sivertsen, et al.

On October 21, 1939, the Honorable Norman E. Peterson, Judge of the District Court for Mower County, made an order dismissing the lawsuit instituted by Herbert Matthew Fisch, M.D., of Austin, Minnesota, and Fraternal Order of Eagles, Lookout Aerie No. 703, at Austin, Minnesota, against the Minnesota State Board of Medical Examiners. Judge Peterson ordered a stay of 40 days in order to permit the plaintiffs to appeal to the Supreme Court of Minnesota, if they so desire.

This lawsuit was instituted by Dr. Fisch and Fraternal Order of Eagles following a hearing held by the Minnesota State Board of Medical Examiners on July 6, 1939, and following a ruling by the Honorable J. A. A. Burnquist, Attorney General of the State of Minnesota, and Mr. John A. Weeks, Assistant Attorney General, that the furnishing of medical care by the Fraternal Order of Eagles at Austin, Minnesota, is a violation of the laws of the State of Minnesota, particularly those laws relating to the practice of healing and the practice of medicine. The Attorney General also ruled that Dr. Fisch, and any other doctor, who is a party to the operation of such a plan, subjects himself to disciplinary proceedings in the form of a suspension or revocation of his license as a physician and surgeon. The purpose of the lawsuit was to obtain an injunction restraining the Minnesota State Board of Medical Examiners from interferring with the operation of the plan and from taking any steps to suspend or revoke the license held by Dr. Fisch. The lawsuit was also directed against the members of the Mower County Medical Society, but the plaintiffs dismissed their case against the Mower County Medical Society when the case was called for hearing in Court.

The plan pursued by the Eagles Lodge at Austin, is briefly as follows: The various members of the Eagles Lodge pay $12.00 per year in dues to the local aerie or lodge. Out of this amount the sum of $4.00 per year per member is allocated for medical care and this fee is split equally between Dr. Fisch, a duly licensed physician and surgeon, and Dr. Leon C. Nicholsen, a duly licensed osteopath, irrespective of which one attends the patient. The Eagles Lodge at Austin has about 1,200 members and while the constitution of the Lodge provides for the payment of $2.00 per year per member for medical care, this figure has been increased by the local aerie. The legality of this plan was questioned by the Medical Board in 1937, following which, legal counsel for the Grand Aerie of Eagles appeared before the Board and advised the Board that despite the fact that the furnishing of medical care was advantageous to the Fraternal Order of Eagles from the standpoint of obtaining members, there were certain objectionable features to the plan, and that while they would not concede that the plan was unlawful, they would terminate the plan if they were given until June 1, 1938, in order to work out other suitable benefits for the members, such as, an increase in the cash sick benefit paid by the Aerie. The Medical Board was also assured that no new aeries would be organized in Minnesota under the old plan and accordingly, the Board passed the matter for the time being. Several of the aeries thereafter voluntarily discontinued the operation of the plan, including aeries in St. Paul and Minneapolis. However, the aerie at Austin, and in two or three other communities in Minnesota, continued to furnish medical care under such a plan, which resulted in the hearing held before the Board on July 6, this year, and the subsequent ruling by the Attorney General of Minnesota. The Supreme Court of Minnesota has ruled that neither a corporation, nor a lay person, can practice law, directly or indirectly, through the medium of employing a licensed attorney to practice law for others for the benefit or profit of the corporation or layman. The Supreme Court of Minnesota stated:

> "We are just as firmly convinced that it is improper and contrary to statute and public policy for a corporation or lay man to practice medicine in the same way."

The Supreme Court of Minnesota also stated:

> "What the law intends is that the patient shall be the patient of the licensed physician, not of a corporation or layman. The obligations and duties of the physician demand no less. There is no place for a middleman."

Under the plan pursued by the Fraternal Order of Eagles the aerie physician is obligated to furnish medical care, not only to the member, but to his entire family.

Saint Paul Man Sentenced to Three-Year Prison Term for Fraud in Obtaining Narcotic Prescriptions

Re: State of Minnesota vs. Morris William Herman, alias William Herman, alias William Stearn, alias William Sterns, alias William Gordon.

On November 15, 1939, Morris William Herman, 28 years of age, entered a plea of guilty to an information charging him with a violation of the Minnesota Uniform Narcotic Act, and was sentenced by the Honorable Gustavus Loevinger of the District Court of Ramsey County, to a term of not less than two, and not more than three, years at hard labor in the State Reformatory at St. Cloud. The defendant was arrested on November 2, 1939, in the office of a St. Paul physician from whom he had previously obtained two prescriptions for a preparation containing narcotics, through the use of a false name and a fictitious address. The investigation leading up to the defendant's arrest was conducted by the Federal Bureau of Narcotics and the St. Paul Police Department. Upon being questioned by Judge Loevinger at the time of sentence, the defendant stated to the Court that none of the physicians had made any examination of him to determine whether or not it was necessary to prescribe a preparation containing a derivative of opium. In addition, the prescriptions disclose that one St. Paul physician wrote for the defendant at two different addresses within a period of four days. The defendant has a long criminal record dating back to 1928. On December 18, 1928, he was sentenced in the District Court of Ramsey County to a term of not to exceed five years in the State Reformatory at St. Cloud on a charge of assault with intent to commit rape. In March, 1934, he pleaded guilty in the United States District Court at St. Paul, to an indictment charging him with possessing an unregistered still. At that time he was sentenced to two years in the United States Penitentiary at Leavenworth and fined $600.00. He served the sentence at St. Cloud, and he also served the sentence at Leavenworth. Between November 28, 1937, and June 22, 1939, he was convicted nine times in the Municipal Court in St. Paul on charges of drunkenness.

Herman obtained his first narcotic prescription from a St. Paul physician on October 14, 1939, by giving the name of William Sterns, 422 Como Avenue. The prescription called for one ounce of laudanum, 1½ ounces of olive oil and ½ ounce of turpentine. The prescription directed that the preparation be applied to the back as needed. The physician who wrote this prescription states that he made a partial examination of the defendant, and also made inquiry of a pharmacist to determine if it was possible to separate the laudanum from the olive oil and turpentine. Thereafter Herman obtained 19 additional prescriptions from eight St. Paul physicians, including the first physician he went to, or a total of twenty prescriptions in eighteen days. All of the prescriptions called for the same ingredients with the exception that in two of the prescriptions the amount of laudanum, olive oil and turpentine was doubled. Herman used the following names in obtaining the prescriptions: William Herman, William Stearn, William Sterns and William Gordon. In addition to the address of 422 Como Avenue, he used the following addresses: 473 Como Avenue, 66 Summit Avenue and the Empress Hotel. There is no such address as 422 Como Avenue, while 473 Como Avenue is the address of a family who have no acquaintance whatsoever with the defendant. Defendant admitted that he never had lived at 66 Summit Avenue and had only been at the Empress Hotel on one or two occasions. He stated to the Court that the address of his parents was 203 E. Indiana St., St. Paul. A number of the physicians frankly admitted that they made no examination of the defendant and they have also expressed their regrets at being so careless in the prescribing of narcotics. The usual pretext advanced by Herman to obtain a prescription was to advise the physician that his own doctor was out of the city and that this preparation was the only one that gave his back any relief. On being questioned by Judge Loevinger as to what disposition he made of the preparation after obtaining it at the drug store, Herman rather vaguely described a "Dick Evans" to whom he delivered the preparation at a pool hall in the basement of the Hamm Building. The facts indicate that Herman is not an addict inasmuch as he was in jail for 14 days prior to being sentenced and he showed no withdrawal symptoms.

Agents of the Federal Bureau of Narcotics state that it is a simple matter to extract the tincture of opium from this preparation, and undoubtedly the tincture of opium is diverted in an unlawful manner to a person not entitled to receive it. The facts indicate extreme carelessness on the part of the physicians in the issuing of these prescriptions. It is a criminal offense for a physician to prescribe, administer or dispense any of the derivatives of opium, except in the bona fide practice of medicine. The Supreme Court of the United States has held that the test is the presence or absence of good faith on the part of the attending physician. Good faith can hardly be said to be present unless a patient is given a thorough medical examination before the physician prescribes any narcotics, irrespective of whether they are to be used internally or externally. In the second place, a physician should be extremely careful when a patient comes into his office requesting a prescription containing a derivative of opium, notwithstanding any pretext given by the patient about his own physician being out of the city. The medical profession should not undertake to decide whether or not a narcotic can be extracted from a preparation or diverted to an unlawful use. If they will confine their efforts to examining the patient to determine whether or not he needs such a narcotic preparation, it will then be unnecessary for the medical profession to assume the responsibility for any unlawful diversion of narcotics. Lastly, under the laws of the State of Minnesota, a violation of the Federal or State Narcotic Laws is a ground for the suspension or revocation of a physician's license to practice medicine. The State Board of Medical Examiners has repeatedly published warnings about the necessity of a physician refusing to write prescriptions or to furnish narcotics to persons who are not entitled to such drugs. Nevertheless, despite all the publicity that has been given on the subject, the medical profession permits themselves to be victimized and unless there is an improvement in this respect it will result in a criminal prosecution against the physicians and the suspension or revocation of their license to practice medicine.

Ramsey County District Court Upholds Five Year Suspension of Lake City Physician's License

In the Matter of the Revocation of the License of
Gottfried Schmidt, M.D.

On November 6, 1939, the Honorable Carlton McNally, Judge of the District Court of Ramsey County, made an order affirming the five-year suspension of the license of Gottfried Schmidt, M.D., of Lake City, Minnesota. Dr. Schmidt's license was suspended on December 16, 1938, by the Minnesota State Board of Medical Examiners following a hearing in which Dr. Schmidt was found guilty of advertising "professional superiority to, and greater skill than, that possessed by fellow physicians and surgeons," and of "conduct unbecoming a person licensed to practice medicine in the State of Minnesota and detrimental to the best interests of the public." Judge McNally in his order stated: "It is the opinion of the Court that the action of the Board of Medical Examiners was neither arbitrary, oppressive nor unreasonable, and that the evidence adduced before the State Board afforded a reasonable and substantial basis for the order made by the Board suspending Relator's license to practice medicine for a period of five years from December 16, 1938."

The testimony before the Medical Board showed that Dr. Schmidt represented to patients that he was able to diagnose diseases by having the patient place sputum on a piece of paper, which was then placed on the abdomen of either the patient or a woman employed by Dr. Schmidt in his office at Lake City, and then having the patient, or the person employed for that purpose, hold various medicines in their hand. The testimony also showed that Dr. Schmidt had represented to patients that he had a machine in his office by which he could broadcast treatments to patients without the necessity of the patients coming to his office. Letters were also received in evidence, written by Dr. Schmidt to various patients, indicating that the patients were afflicted with aluminum poisoning, Avian Tuberculosis and various other ailments. Dr. Schmidt was warned by the Medical Board in 1936, to desist from these practices. However, he paid no attention to the warning and a citation was served upon him which resulted in the hearing before the Medical Board and the suspension of his license. Thereafter Dr. Schmidt took an appeal to the District Court of Ramsey County, and the matter was heard by Judge McNally on October 21, 1939. The records of the Medical Board show that Dr. Schmidt was born in Minnesota in 1871, and graduated in 1903, in medicine from the University of Minnesota.

License of Dassel Physician Suspended for Three-Year Term Because of Use of Narcotic Drugs

In the Matter of the Revocation of the License of Stephane Dulude, M.D.

On November 3, 1939, the Minnesota State Board of Medical Examiners suspended, for a period of three years, the license to practice medicine held by Stephane Dulude, M.D., of Dassal, Minnesota. Dr. Dulude was served with a citation in September requiring him to show cause why his license as a physician and surgeon should not be revoked because of habitual indulgence in the use of drugs. Dr. Dulude was advised, at that time, to surrender his narcotic stamp tax to the Collector of Internal Revenue and his narcotic government order book to the District Supervisor of the Narcotic Bureau at Minneapolis. A similar request had been made of Dr. Dulude by agents of the Narcotic Bureau. However, Dr. Dulude refused to do either. Dr. Dulude was also instructed to immediately place himself in a suitable hospital for treatment by a licensed physician and surgeon. However, he made no attempt to be hospitalized until October 1st, and then for only a period of three weeks. The records of the Bureau of Narcotics disclose that on May 4, 1939, when the government inspection was made, Dr. Dulude was short approximately 3,500 ¼-grain morphine sulphate hypodermic tablets, 3,500 ⅙-grain morphine sulphate hypodermic tablets and 3,500 ⅛-grain morphine sulphate hypodermic tablets, or approximately 1,895 full grains of morphine sulphate hypodermic tablets. The investigation made by the Minnesota State Board of Medical Examiners disclosed that from the date of the government investigation on May 4, 1939, up to August 24, 1939, Dr. Dulude continued to purchase enormous amounts of narcotics, his orders totaling 2,400 ¼-grain morphine sulphate hypodermic tablets, 1,200 ⅙-grain morphine sulphate hypodermic tablets and 1,200 ⅛-grain morphine sulphate hypodermic tablets, or a total of 950 full grains of morphine sulphate hypodermic tablets in a period of less than four months, and despite the fact that the government was then investigating his practice.

License of Willmar Physician Revoked Following Conviction for Criminal Abortion

In the Matter of the Revocation of the License of Iver S. Benson, M.D.

At the regular meeting of the Minnesota State Board of Medical Examiners held in St. Paul on November 3, 1939, the license to practice medicine formerly held by Iver S. Benson, M.D., of Willmar, Minnesota, was revoked. Dr. Benson had been previously served with a citation requiring him to show cause why his license as a physician and surgeon shoud not be revoked because of the procuring, aiding and abetting, on his part, of criminal abortions. Dr. Benson is confined in the State Reformatory at St. Cloud, Minnesota, following his plea of guilty on September 28, 1939, in the District Court at Willmar, Minnesota, to an information charging him with the crime of abortion. Dr. Benson is serving a term of not to exceed four years, following the death on August 15, 1939, of a young married woman from Montevideo, Minnesota.

List of Physicians Licensed by the Minnesota State Board of Medical Examiners on November 3, 1939

October Examination

Anderson, Charles Leonard—U. of Minn., M.B. 1939, M.D. 1939, Proctor.
Brown, George Emerson—U. of Minn., M.B. 1938, M.D 1939, Rochester.
Brown, Joe Robert—U. of Iowa, M.D. 1937, Rochester.
Burkland, Carl Edwin—Johns Hopkins, M.D. 1935, St. Paul.
Cowan, Jack Thomas—Northwestern, M.B. 1938, M.D. 1939, St. Paul.
Donald, Charles Johnson, Jr.—Tulane U., M.D. 1936, Rochester.
Elliott, James Francis—U. of Alberta, M.D. 1936, Rochester.
Gambill, Earl Edward—U. of Pa., M.D. 1935, Rochester.
Golden, Robert Fred—Geo. Wash. U., M.D. 1937, Rochester.
Hall, Howard—U. of Minn., M.B. 1938, Minneapolis.
Heilman, Charles—Northwestern, M.B. 1934, M.D. 1935, Rochester.
Hoidale, Porter Maderia—U. of Minn., M.B. 1939, St. Paul.
Hughes, John Davis—U. of Tenn., M.D. 1935, Rochester.
Hughes, Theodore James—McGill U., M.D. 1937, Rochester.
Hummer, George John—Rush Med. Col., M.D. 1937, Rochester.
Hunt, Robert Sellen—Northwestern, M.D. 1938, Fairmont.
Johnson, Clive Roland—Rush Med. Col., M.D. 1937, Rochester.
Kallestad, Leonard Lester—U. of Minn., M.B. 1938, M. D. 1939, Minneapolis.
Knudson, Alvin Bernt Clifford—U. of Minn., M.B. 1938, M.D. 1939, Minneapolis.
Kvarnes, Robert Gordon—U. of Minn., M.B. 1938, Minneapolis.
Lien, Richard J.—U. of Minn., M.D. 1937, Rochester.
Lipscomb, Paul Rogers—Med. Col. of S. Car., M. D. 1938, Rochester.
Mader, James Wilson, Jr.—U. of Pa., M.D. 1937, Rochester.
Mattson, Albert Donald—U. of Minn., M.B. 1939, Duluth.
Mears, Robert Fuller—U. of Minn., M.B. 1938, Minneapolis.
Pattison, Donald Haggart—U. of Wis., M.D. 1936, Rochester.
Pearson, Clarence Coplyn—U. of Texas, M.D. 1937, Rochester.
Peterson, Wendell Gladstone—U. of Minn., M.B. 1938, M.D. 1939, Rochester.
Poppe, Frederick Paul—U. of Minn., M.B. 1938, Minneapolis.
Power, Harry Waldo—Northwestern, M.B. 1938, M.D. 1939, Saint Paul.
Quick, Edwin Danford—U. of Minn., M.B. 1936, M.D. 1937, Rochester.
Schmidt, Mary Alice—U. of Minn., M.B. 1938, M.D. 1939, Minneapolis.
Shelden, James Thomas—U. of Minn., M.B. 1937, M.D. 1938, Rochester.

(Continued on Page 871)

◆ OF GENERAL INTEREST ◆

Dr C. H. Clark, formerly of Pipestone, is now located in Rushmore.

* * *

Dr. Fred H. Wiechman, formerly of Cass Lake, has opened offices in Montgomery. Dr. Wiechman will make his residence in New Prague.

* * *

Dr. L. F. Wasson who has been associated with Dr. E. Haberman in the practice of medicine in Osakis, has moved to Alexandria where he will be associated with Dr. A. D. Haskell.

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Drs. Earl C. Henrikson, Herman Michael Koller and Louis Robert Koller of Minneapolis were among those who were awarded fellowships in the American College of Surgeons recently.

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Dr. M. B. Dahle, formerly of Warroad, has opened an office in Glenwood. Dr. Dahle is a graduate of Rush Medical College, served as an interne in the Asbury Hospital, Minneapolis and did surgical work in the Swedish Hospital, Minneapolis.

* * *

Dr. Edward P. Burch, Saint Paul, was married December 3, 1939, to Miss Conradine Sanborn, daughter of Mr. Bruce W. Sanborn, Saint Paul. Dr. Burch is associated with his father, Dr. Frank E. Burch, in the practice of ophthalmology.

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All physicians and surgeons in good standing are invited to attend the fourth assembly of the International College of Surgeons to be held at Venice, Florida, February 11-14, 1940. Inquiries may be addressed to Dr. Fred H. Albee, 57 West 57th Street, New York City.

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Dr. Harry L. Plotke has opened offices in Little Falls. A graduate of the University of Minnesota Medical School in 1937, Dr. Plotke served his interneship at Ancker Hospital, Saint Paul, and served a year at Minneapolis General Hospital. More recently he has served as a physician at the Cass Lake Indian Hospital.

* * *

Dr. Irvine McQuarrie, Professor of Pediatrics at the University Medical School, will sail December 15 from San Francisco with his wife and two daughters for Peking, China. He expects to spend six months as visiting professor of pediatrics at the Peking Union Medical College, which is operated by the Rockefeller Foundation. Dr. A. E. Hansen will be in charge of the pediatrics department during Dr. McQuarrie's absence.

* * *

The Minnesota Hospital Service Association rendering service in the Twin Cities, Duluth, Stillwater and Fergus Falls has a present enrollment of 300,000. Since the inauguration of the plan some 58,000 subscribers have been hospitalized and $1,610,000 paid the hospitals for services rendered. The days of hospitalization allowed have been increased from twenty-one days for the first year to twenty-four days the second year, twenty-seven the third year and thirty days the fourth year. Coverage for dependents has increased from 25 to 50 per cent. Overhead costs have been kept at 10 to 11 per cent.

* * *

The Minnesota Department of Health announces the following changes in laboratory services:

The Kline exclusion test will be carried out on all blood specimens submitted for Wassermann tests. All specimens showing positive or doubtful reactions will be subjected to the Kolmer-Wassermann and the Kline diagnostic tests. However, the Kolmer-Wassermann test will be done routinely on all specimens from children under ten years (cord blood excepted) and on spinal fluid.

Culture will replace animal inoculation for the detection of tubercle bacilli.

The Neufeld method will replace the mouse test for pneumonia typing, but pneumonia sputum will be examined for tubercle bacilli as formerly.

* * *

The Nobel Prize this year was awarded to Prof. Gerhard Domagk for his research with the drug sulfanilimide and its derivatives. Professor Domagk was born in Lagow, Germany, in 1895. Serving in the German army during the World War he received his medical degree from Kiel University. After doing research in pathology he became director of the Institute of Experimental Pathology in the I. G. Dye Works in Elberfeld. Late in 1932 Professor Domagk first demonstrated the curative effect of prontosil in streptococcus infections in mice. Clinical trial in human cases in the following two years proved its efficacy. In 1937 Professor Domagk received the Emil Fischer Medal, the highest award of the German Chemical Society, and in 1939 the Cameron prize of the University of Edinburgh, Scotland.

* * *

The Memorial Pilgrimage in honor of Drs. William J. and Charles H. Mayo to Rochester was carried out October 27, 1939, as arranged by the Council of the Minnesota State Medical Association.

Plummer Hall was filled with friends of the late Mayo brothers, many from the more remote areas of the state, to pay their homage. At the ceremony, presided over by Dr. George Earl, president of the State Association, Dr. E. L. Tuohy of Duluth, paid tribute to the lives and characters of Dr. Will and Dr. Charlie.

Following this gathering some three hundred in attendance proceeded in a line of automobiles a mile long to Oakwood Cemetery, where wreaths were placed upon the graves of the two brothers by Dr. Arnold Schwyzer and Dr. Charles W. More.

The addresses made on the occasion of the Pilgrimage appear elsewhere in this issue.

* * *

Distribution of Pneumonia Serum

Owing to lack of funds the distribution of pneumococcus anti-serum other than for Types I and II was discontinued July 1, 1939, on approval of the Minnesota State Board of Health. This matter had been taken up with the Councillors of the Minnesota State Medical Association at their meeting June 1, at which time the continuation of typing specimens for all thirty-two types of pneumococci and reporting on all types but furnishing serum for only Types I and II was approved. At the meeting of the State Board of Health, November 15, it was decided that, using federal funds, now available, the Division of Preventable Diseases would again distribute therapeutic pneumomoccus anti-serum for all higher types as well as for Types I and II and continue twenty-four-hour typing service as usual. These funds may not last the entire season. However, the program as outlined above will be followed as long as funds permit.—A. J. Chesley, Executive Secretary, State Board of Health.

MEDICAL BROADCAST FOR DECEMBER

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 11:00 o'clock every Saturday morning over Station WCCO, Minneapolis (810 kilocycles or 370.2 meters) and Station WLB, University of Minnesota (760 kilocycles or 395 meters).

Speakers: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota. The program for the month will be as follows:

December 2—Pernicious Anemia.
December 9—Iron Deficiency Anemia.
December 16—Deficiency Disease.
December 23—Streptococcic Infection.
December 31—Care of the Teeth.

STATE MEETING

The honor of holding the first medical meeting ever staged in the fine new auditorium built and given to Rochester by the late Drs. William J. and Charles H. Mayo, goes by special invitation to the Minnesota State Medical Association.

The occasion is the 87th Annual Meeting of the Association which will be held in the new auditorium in Rochester, April 22, 23 and 24, 1940, with Council and House of Delegates meetings scheduled for Sunday, April 21, at the Kahler Hotel. The new building is situated in Mayo Park, within three blocks of the center of Rochester. It has a fine modern Arena, fully equipped, and a splendid theater. Surrounding it are the gardens and lawns of Mayo Park and nearby stands the bronze figure of the father of the great surgeons, Dr. William Worrall Mayo.

It is peculiarly appropriate that the Minnesota State Medical Association, which all three of these men served as president, should be the organization chosen to throw open the doors of the new building to medical colleagues of Minnesota and the Northwest.

Outlines of the scientific program for the occasion were drawn up at the first meeting of the Committee on Scientific Assembly, held under the chairmanship of Dr. B. S. Adams of Hibbing, president-elect of the association, on November 9.

Monday's program will be given over exclusively to clinics and round table luncheons conducted by members of the Mayo Clinic. An open house in the Auditorium Arena for all convention guests will climax the program of the Clinic on Monday night. Exhibits will remain open for this event and refreshments and entertainment will be provided.

Eight distinguished out-of-state guests have been invited by the committee and the special societies to address the Tuesday and Wednesday sessions. Other Minnesota speakers together with the guest speakers will conduct another series of round table luncheons on Tuesday. The annual banquet of the association will be held Tuesday night at the Rochester State Hospital.

Physicians from all over the Northwest will be invited to attend the meeting.

WASHINGTON COUNTY

The Washington County Medical Society held its regular monthly meeting on October 10 at the Stillwater Club rooms. The guest speaker for the evening was Dr. Carl L. Larsen, of Saint Paul, who gave a very interesting talk on "Medical and Surgical Diseases of the Eye, Ear, Nose and Throat," especially dwelling on such cases as come under the observation of the general practitioner. He gave the latest ideas of treatment and emphasized some dangers that might be encountered in the treatment of these organs.

The regular meeting for the month of November, held on November 14, at the Stillwater Club rooms, was addressed by Dr. Frank J. Savage, of Saint Paul. Dr. Savage is the state chairman for the National Physicians' Committee for the Extension of Medical Service. He spoke at length on the subject and answered many questions pertaining to it. This is now a very important subject. A committee of four doctors met with the Stillwater School Board in the matter of acquiring an audiometer for use in Stillwater, Oak Park, and Bayport schools by the school nurse. This subject was thoroughly discussed at a county meeting, some members believing that no diagnostic instrument should be put in the hands of the laity. The matter, as far as the Society is concerned, is still unsettled. The Society went on record in favor of a full-time county health nurse.

E. Sydney Boleyn, M.D.,
Secretary.

THE JOHN W. BELL LECTURE

The Fifth Annual John W. Bell Tuberculosis Lecture will be delivered by Dr. Frederick Taylor Lord, of Boston, on the evening of Monday, December 4, in the Auditorium of the Hennepin County Medical Society. The title of the lecture will be "The Clinical Aspects and Diagnosis of Pulmonary Lesions" and it will include a discussion of the history, physical and x-ray examinations and such special methods of examination as bronchoscopy, bronchography and thoracentesis. Such clinical groups as hemoptysis, primary pleurisy, pneumonia and pulmonary tuberculosis will be considered. The lecture will be illustrated with lantern slides.

Dr. Lord, a graduate of Harvard Medical School, has spent his entire professional life in Boston, specializing in diseases of the chest. He has been a teacher in his alma mater and on the staff of the Massachusetts General Hospital for over thirty years and is now emeritus clinical professor of medicine in the former and a member of the board of consultation in the hospital.

TRANSACTIONS of the MINNEAPOLIS SURGICAL SOCIETY

Stated Meeting, Thursday, May 4, 1939

President, DR. GEORGE R. DUNN, in the Chair

Secretary, DR. HARVEY NELSON

REGIONAL ENTERITIS

Report of Case

Lawrence M. Larson, M.D., Ph.D.
Minneapolis

All physicians doing abdominal surgery should be thoroughly familiar with the condition termed regional ileitis. This is especially true because not infrequently an obscure abdominal condition not diagnosed preoperatively will be revealed at operation as ileitis. Many instances in the past of this disease have gone untreated or, at best, simple appendectomy done because of unfamiliarity with its therapy. The disease is characterized by subacute or chronic inflammatory changes in the small bowel which result in cicatrization, stenosis and fistula formation. Many of these cases are not diagnosed preoperatively. The reason for this difficulty is the rarity of the condition along with its confusing symptomatology, especially its differentiation from appendicitis, ulcerative colitis, intestinal tuberculosis and neoplastic disease. It is with this thought in mind that a description is herewith given of the main features of the disease together with a case report illustrating many of these points. Furthermore, the disease is rare enough so that its life history, especially as influenced by various methods of treatment, is worth recording.

Prior to 1932 many cases of cicatrizing enteritis producing tumefaction were present in the literature. However, in 1932, following the work of Crohn, Ginzburg and Oppenheimer, this group of cases was classified under the heading of a new disease, as distinguished from those with a specific etiology such as tuberculosis, lues, actinomycosis, amebiasis and so forth. Since this work, further studies have corroborated their findings. At first consideration, it would seem that the condition is becoming more common. This probably is not true, since perusal of the literature shows many nonmalignant granulomatous tumors of the bowel which could fall into the classification described. Studies of this disease by Ginzburg, Crohn, and Oppenheimer showed definite exclusion of a specific etiologic factor. While their studies did not establish a particular organism as the causative factor, yet they described the pathologic and clinical factors so clearly that no doubt was left as to the fact that the disease is a definite entity, as yet of unknown etiology. It seems strange that previous to their description the disease was unrecognized—in fact one wonders whether it really existed, since few reports accurately describe a condition coinciding with regional ileitis. Their original article was so complete that little has been added although approximately 600 cases have been reported since 1932. The main contribution since their original work has been the demonstration of an identical disease process affecting any segment of the small bowel and occasionally the colon. Other than this, since the report of the first case there has been little added to our conception of this disease.

Etiology and Pathology.—Many names have been suggested for this disease but the term "regional ileitis" seems most expressive and applicable. Other names used are terminal ileitis, chronic ulcerative ileitis, and chronic cicatrizing ileitis. The disease is definitely one of young adults although it has been described in children and in elderly individuals. It occurs twice as often in males as in females. The disease, as stated, is of an unknown etiology although, because of the large number of giant cells in histologic section in some cases, tuberculosis has been suspected. These giant cells probably are produced by the presence of food particles gaining entrance to the tissue through ulcerations of the mucosa. No acid-fast bacilli have been demonstrated. Bacillary dysentery has been described as a forerunner of the disease but agglutination tests do not bear this out. Felsen's work in substantiation of this theory has not been proved in subsequent work. Various diplococci, streptococci, and bacilli have been found in the lesions but these are undoubtedly incidental findings.

Recently Pumphrey made an extensive study on the etiology of this disease, including bacteriologic and pathologic examination of the bowel lesions and of the regional nodes, but was unable to identify any causative organism. Tuberculous etiology was excluded by negative reactions to guinea pig inoculations and evidence of dysentery organisms was not found by the usual agglutination reactions of the patient's serum. It is still entirely possible, however, that an atypical tuberculosis could produce the picture of this disease. In an interesting piece of work Reichert and Mathes produced chronic lymphedema of the intestinal walls by the injection into the regional lymphatics of an irritating material. This produced a picture similar to that seen clinically in regional ileitis, characterized by low grade infection associated with edema of the intestinal wall. It seems entirely possible that an adenitis in the mesentery, especially near the ileocecal region, could produce this picture. Anatomical abnormalities of the ileum, and anomalies of position and fixation resulting in stasis, kinking, twisting and intussusception, and accidental piercing of the mucosa by foreign bodies (such as fish bones) followed by subsequent bacterial invasion have all been mentioned as of etiologic significance. At any rate the etiologic factor still remains a conjecture.

Grossly the bowel afflicted by this disease is characterized by a segment 10 to 40 cm. in length which is thickened, hypertrophic, soggy, and edematous and covered by a reddened serosa. The lumen of the bowel is decreased in size due to this thickening. The corresponding mesentery is likewise affected and is of a similar thick, edematous appearance. Small tubercle-like areas frequently occur on the serosa but these are collections of lymphocytes and are not tuberculous. The mucosal side of the bowel is likewise hypertrophied, smooth, and of cobblestone appearance. There is no elasticity either to the bowel or its mesentery. As a result of this hyperplasia, the wall of the bowel becomes so thickened that it takes on a rope-like rigidity. The location of the diseased area is more frequently in the terminal ileum although it may occur anywhere in the small gut. It has been described in all portions of the jejunum or ileum. There is some evidence to indicate that the older lesions are located near the ileocecal valve while the more recent ones are situated proximally as high as the upper jejunum. The appendix has not been found to be involved in the inflammatory process although it may exhibit varying degrees of subacute inflammation. The latter is due to secondary involvement rather than a primary one.

In early cases, ulcerations of the mucosa have been described as consisting of oval areas about one centimeter in diameter lying on the mesenteric border of the small bowel. This finding undoubtedly represents a very early stage of the disease, one which is rarely seen because the diagnosis of this disease at this time is practically never made. At a late stage there may be almost a complete loss of epithelium, and in healing areas the surface is polypoid and granular.

Histologically, varying degrees of acute, subacute, and chronic inflammations are present. There are no specific characteristics. In the earlier lesions the reaction is more likely to involve mainly the mucosa and submucosa while later the serosa shows a similar disease process, indicating the origin of the disease is in the mucosa, with progression towards the serosa. There may be edema, lymphoid cells in focal collections, giant cells, etc. Confusion with tuberculosis has resulted from the finding of giant cells, but these originate from a foreign body reaction present when food particles lodge in the mucosa. True tubercles with caseation and epithelial reaction are absent. Late, fibrous tissue piles up and replaces the submucosa and muscularis. The mesentery is likewise infiltrated by an inflammatory exudate and bleeds readily.

Since the inflammatory process is an extensive one, adhesions of neighboring structures take place with consequent slow perforation and fistula formation. This is a common feature of the disease and usually takes place between a loop of small bowel and the colon. Thus spontaneous cure or alleviation may occasionally occur. Perforation into the free peritoneal cavity is practically unknown but when it does occur it is such a slow process that abscess formation takes place. When such an abscess is drained surgically, the resultant fistula persists until it is surgically repaired. Incomplete removal of the diseased area likewise usually results in the formation of an external fistula.

The end-result of any chronic inflammation is scar formation, and this is likewise true in regional ileitis. Stenosis eventually takes place by replacement of the submucosa and muscularis with fibrous connective tissue, producing the typical obstructive phenomena which characterize this disease. At times the ileocecal area may be so thickened and narrowed as to barely admit a probe. Above the stenotic area, the bowel becomes hypertrophied and dilated due to the compensatory mechanism of attempts to overcome the obstruction. After obstruction occurs, the conditions are the same as exist for any other obstruction.

Clinical Features.—In all series of cases reported, it has been emphasized that young adults predominate 2:1 with the ratio of males to females being reported as about 5:1. The symptoms run a characteristic course and correspond to what one would expect from the pathologic changes. Since the disease is one of obstruction superimposed upon an enteritis, the symptoms are dependent upon the stage of the pathologic process. The most frequent symptoms are abdominal pain, cramps, diarrhea, nausea, vomiting, distention, and loss of weight and strength.

The disease may usually be divided into four stages. The first is that of an acute inflammatory condition with leukocytosis, low grade fever, pain over the lower abdomen, especially the right side. It is this stage in which appendectomy is frequently done. Later, excessive intestinal activity is present such as nausea, vomiting, cramps, diarrhea and these symptoms may come intermittently. It is common to palpate a mass at this stage. If treatment is not successful, the stenosing effect soon becomes the prominent feature. Distention, severe cramps, visible peristalsis, anemia, malnutrition soon follow. The final stage occurs when either acute obstruction or perforation and abscess formation takes place. Debility, malnutrition and anemia by this time may be extreme, due to reduced food and fluid intake and to toxemia and loss of fluids from diarrhea. Remission of symptoms is common.

The diagnosis is confirmed by x-ray and the barium is used first by enema before being administered by mouth, since it is possible that a partial obstruction may be converted into a complete one by the packing effect of the barium. However, it is best to use both methods if at all possible. The main diagnostic signs have been described by Kantor: (1) a filling defect just proximal to the cecum; (2) abnormality in contour of the last filled loop of ileum; (3) dilation of loops of ileum just proximal to the lesion; (4) a "string" sign representing the actual lesion. Other stenosing lesions of the bowel such as tuberculosis may produce similar signs so that the x-ray alone is not pathognomonic. The most common disease requiring differential diagnosis is chronic ulcerative colitis and this of course is of importance, since it is a disease treated medically, while regional ileitis is a surgical condition. The other lesions to be considered are tuberculosis, syphilis, actinomycosis, malignancy, appendiceal abscess, foreign body, etc. Many times exploratory operation alone will settle the diagnosis.

Treatment.—The ideal form of treatment by no means has been found and it is possible that in the future some form of medical measures may cure this disease. At present, however, it is certain that surgical procedures are the only ones which so far have produced cures. In the preoperative care there are several factors of great importance. First of all it is imperative to build these patients up prior to any surgical procedure, by intravenous infusions of fluid glucose, blood transfusions, and so forth. Secondly, the importance of decompression of the bowel both preoperatively and postoperatively cannot be overemphasized. This of course is best done by the nasal catheter suction siphonage of Wangensteen. Continual suction postoperatively until peristaltic activity has returned is recommended as a preventative of distention. Experience has shown that gaseous distention is much more easily prevented than relieved after it has occurred.

There is no question that primary resection with anastomosis offers the best chance for cure, in the light of our present knowledge of this disease. Ileocolostomy alone in some cases of course is necessary where the patient's condition prohibits more extensive operation. However, in these cases it is questionable whether the portion of bowel put at rest will heal. There is much evidence to show that extension of the disease will still take place; in fact the large majority of cases observed so far have actually done so. If obstruction has occurred, and only a short circuiting operation done, then a blind stump is left, which produces reflex and toxic disturbances which may be very annoying to say the least. Therefore, if resection of the diseased bowel cannot be done at the first stage, it certainly should be done at a later time.

Case Report

This patient when first seen was twenty-six years of age. She had been married two years and had been in exceptionally good health except for the disease described. Her past history and family history was irrelevant. About four years prior to her admission to the hospital she first noticed increasing pain in the right lower quadrant which at first was of a mild colicky nature, lasting only a few minutes, and came after eating. Soon, however, this pain increased in its severity, the spells became more frequent, and as time went on they increased in their duration. She noticed that certain foods such as vegetables, coarse breads, and heavy foods aggravated her symptoms, so therefore she learned to avoid them. After about six months of these symptoms she lost from ten to fifteen pounds in weight. About this time there appeared intervals of nausea which were prone to come on at the time when the abdominal pain occurred. It was not long after this that she occasionally vomited a meal soon after eating. Appendectomy was done in December, 1932, with about five to six weeks of relief, mainly because she ate little or no solid food at this time. Soon, however, when she began to eat normal amounts of food her former symptoms reappeared but she controlled these fairly well by extreme care in her diet. Several weeks after the appendectomy she began to have diarrhea consisting of several liquid stools daily, accompanied with a great deal of colicky abdominal pain. Her loss in weight became progressive and in several months she lost another twenty pounds. She was also weakened considerably and was forced to remain in bed most of the time.

This patient was first seen in November, 1933. She weighed 68 pounds, temperature 100.2 and pulse 94. On examination at this time she appeared quite ill. Her face was rather drawn, her color was pale, and she was in considerable pain. A general examination was negative except for the abdomen. There was a moderate amount of gaseous distention present. A recent right McBurney scar had healed completely. Peristaltic waves were visible throughout the right abdomen. Palpation of the lower abdomen elicited considerable pain especially on the right side and there was slight spasm and rigidity present. There was a suggestion of a sausage-like mass in the lower abdomen on the right side. Pelvic examination gave negative results. Laboratory examination: hemoglobin was 64 per cent; R.B.C. 2,640,000; W.B.C. 18,300. The urine was normal. A tentative diagnosis of obstruction of the lower portion of the small bowel was made and the patient given several days of preparation prior to surgical intervention. Pre-operative care consisted in continuous nasal suction, intravenous fluids, frequent doses of morphine and absolute withdrawal of food and fluid by mouth. In three days the condition of the patient improved markedly. The distention practically disappeared and her pain left her so that no further opiates were necessary. At this time it was considered advisable to study the intestinal tract fluoroscopically by means of a thin suspension of barium given orally. The barium passed readily down the lower portion of the ileum where the bowel was seen to become narrow, producing the typical "string sign." A small portion of barium passed through this obstructed area and some of it appeared to pass directly into the transverse colon. Most of the barium, however, proceeded the usual way through the ileocecal valve. A similar type of barium suspension was used as an enema and by fluoroscopic examination a fistula could be made out between the transverse colon and small bowel. A diagnosis of an obstructive lesion of the small bowel was made. On November 15, 1933, a mid-line incision was made and on exploration of the abdomen there was present a thick, hard, edematous, tumor-like mass involving a segment of the ileum 18 cms. in length located 20 cms. from the ileocecal valve. The corresponding mesentery was thick and edematous. The serosa was dull and rough. The proximal portion of this diseased segment was attached to the middle of the transverse colon and a portion of omentum had attached itself firmly about this area. The regional glands were large and boggy. The remainder of the bowel was entirely normal. Since the patient's condition was rather precarious it was decided that a short-circuiting operation alone was indicated. A portion of ileum 12 cm. proximal to the diseased segment was then anastomosed aseptically to the distal portion of the transverse colon by means of a three-bladed (Rankin) clamp. Fat tags from the omentum were used to reinforce the suture line. Next the attachment of the diseased segment of ileum was removed from the transverse colon and it was found that this represented an internal fistula between the two portions of the bowel involved. After separation of these segments the ileal portion of the fistula was inverted with transverse suture of the layers of the bowel and the suture line reinforced with omentum. A similar process was used in closing the colonic perforation. As a final step in the operation, a Witzel type of enterostomy was done about 15 cms.

above the ileocolostomy. The abdomen was then closed in the usual manner bringing the enterostomy tube through the lower angle of the wound. A transfusion of 500 c.c. of citrated blood was given immediately after the operation.

Postoperatively, nasal suction was used continuously for five days. Foods and fluids were withheld by mouth, intravenous fluids administered, and large doses of morphine given regularly. The enterostomy tube started to drain both gaseous and liquid material on the second day and this continued until the tube came away spontaneously about the seventh day. No fistula remained at the site of this tube and the wound healed promptly. Convalescence was entirely normal. She left the hospital three weeks postoperatively. Her diet consisted of foods with a low residue, and in several months time she regained her usual strength. In three months her weight returned to a normal of 112 pounds and in six months she weighed twenty pounds more than her usual weight. During this time she was allowed an increasing amount of food with bulk, although she was always advised to eat in small amounts and frequently. Her only symptoms during this time consisted of gurgling and occasional colicky pains in her lower abdomen. These disappeared entirely within a year after the operation. Since that time she has undergone two pregnancies, one in 1936 and one in 1938, both of which have been normal. At the present time, five and one-half years after the operation, she is as healthy and as strong as any individual of her age. She has been advised to have a resection of this diseased segment of bowel but she feels so well that so far she has refused. However, she is still careful as to overeating, to overexposure of any sort, or to emotional upsets. There is yet a possibility of recurrence although several x-ray checkups have always showed complete healing of the diseased process. The lumen of the involved area has reopened to practically a normal extent, there is no ulceration of the bowel and no evidence of active inflammation.

In addition to this case, nine additional ones were found in the records of the Department of Pathology at the University of Minnesota. It is interesting to note that only three of these were recorded under their correct name, and the remainder were found only by searching through such headings as ileocolitis, colitis, enterocolitis, enteritis, stenosis of the ileum, atresia of the bowel, granuloma of the bowel, etc. These nine cases offer nothing new or different than what has been described. They illustrate again the fact that since the original description of this disease, little has been added to our knowledge of this disorder.

Discussion

Dr. Russell Morse (by invitation): Members of the Minneapolis Surgical Society, it is a pleasure to be before you again, and to discuss this subject. From our material we can illustrate several things which Dr. Larson has had to say in regard to enteritis. First, the patient that he has discussed. We had the opportunity of x-raying this individual over a period of twenty months, all of the examinations being made post-operative. During that time the picture was relatively the same. We found, as shown in this film, an area of stenosis in the lower ileum, taking in probably about eight or nine inches, the maximum point of stenosis being at the superior extremity and then the amount of stenosis varying at the different levels toward the ileocecal valve. During that period of observation the only change we noticed was that there was a disappearance of rigidity of this segment and a return of pliability. In other words, the first examination, which was made within two months following the operation, still showed active disease and the last examination, which was made about twenty months after operation, showed no evidence of activity.

In the last film made, we had the picture of the end stage of an ileitis in that we had stenosis due to scar tissue formation, without any evidence of activity and probably without any ulceration of the mucous membrane.

In the cases we have seen we were able to demonstrate the various stages of this inflammatory process. It is very important to recognize that in this disease we can have many degrees of severity in the extensiveness of the process, and many degrees of severity in regard to the actual inflammatory process.

The first case which we saw was a typical regional ileitis in that there was an area of stenosis with typical string sign due to a marked stenosis of the entire lower ileum. One streak of barium represented the appendix, while a fainter streak extending through a long segment of the lower ileum was the lumen through the area of stenosis of a granuloma. This individual was observed again thirty days after the first examination and during this period of time the lumen in that segment returned to a fair degree of patency except for the last inch before the ileocecal valve. At this stage a primary resection was done with anastomosis of ileum to transverse colon, and we were able to submit the specimen to the University as a specimen of ileitis.

In the second case we saw, the first films were made about three months after appendectomy was done. At the time of appendectomy the surgeons noticed a boggy edema of the lower ileum. Three months later there was an abscess. Perforation had occurred and there was an abscess in the region of the terminal ileum. This patient was followed for six months and then resection was done. At that time the specimen showed a chronic granuloma. In other words, instead of the edema we had more of a connective tissue proliferation and almost entirely a lymphocytic infiltration. There was even at that time, nine months after onset of the lesion, considerable ulceration of the mucous membrane.

Then we have the lesser degrees of involvement and these vary all the way from minor inflammatory changes to a relatively severe inflammatory process. In one individual the outstanding feature was a lack of pliability of the lower segment of the ileum. The striking thing was that along the mesenteric border we had a complete fixation without muscular contraction, with retention of muscular contraction on the opposite side of the bowel, in fast an increased depth of peristalsis due to the fixation of the mesenteric side —due to induration. That goes with the finding that Dr. Larson has mentioned, that ulceration first occurs along the mesenteric attachment side of the bowel. This patient was also followed along for a good many months and at six months we have a record which shows a return of pliability in this distal segment of the ileum. At this time also the patient was entirely free from symptoms.

Another patient showed a very minor change. There was merely a relative narrowing of the terminal ileum with a moderate dilatation above that point showing that the intestine was having difficulty forcing the barium through the lower segment. This individual had, for some reason or another, an unusual amount of pain. We recognized here that we were dealing with a minor condition as far as the inflammatory process went, and yet, because of the severity of pain, after a period of observation it was decided that operation was necessary. At operation the only thing that could be found was a crackling on palpation of the soft tissues of the terminal ileum due to edema. A primary resection was done. We submitted the specimen to the University and they told us that it looked entirely normal on gross inspection. There was no ulceration of the mucous membrane and yet on microscopic study they found considerable edema and again the characteristic thing—infiltration of the subserosal tissue. Polymorphonuclear leukocytes were more plentiful in the microscopic section than they are in the more granulomatous stages of this disease. This represents a very minimal type of enteritis and yet, for some peculiar reason, in this individual pain was so severe that it was decided that operation was necessary.

In the following case we have another modification. There was no stenosis of the distal segment and yet there was a marked irregularity of the mucous membrane at the terminal ileum and also at the base of the cecum. This lesion was observed first at operation during appendectomy and we had a chance to study it because the condition was recognized. This type of lesion cannot be differentiated in any way from the x-ray standpoint from a tuberculous enteritis or probably from other types of enteritis. I think that in all of these cases one of the first things one must do in a differential diagnosis is to get an x-ray of the chest. If tuberculosis is absent in the chest, then it is reasonable to assume that the lesion in the intestinal tract is not tuberculous. This, by the way, was the youngest individual we had, a boy twelve years old. Most of the others were in the twenties.

It is important to recognize the fact that these conditions are not limited in the small intestine to one segment, that they can occur at any level and in any individual there may be more than one area involved.

The next case dates back to 1927. The patient was x-rayed by Dr. Belden at New York Hospital and the multiple areas of stenosis in the lower ileum were diagnosed as hyperplastic tuberculosis, as we all were doing at that time. The pathologist reported a non-tuberculous lesion. We had a chance to see it because Belden was so flabbergasted by the pathologist's report that he came to us for moral support and we very foolishly, as we know now, told him that we thought he was absolutely right, and the pathologist was wrong. Looking back on it now we know that it was a non-tuberculous enteritis.

In the last two years we have seen three cases with multiple areas of involvement in the small intestine. Dr. Cabot can tell you about one.

In this next case, one of the nurses at St. Barnabas Hospital, there were visible on x-ray several areas of partial stenosis in the upper ileum and in the terminal ileum areas of more complete granulomatous stenosis. This patient also finally came to operation. We observed her over a year and her obstruction became so marked that it was necessary to do something for relief. Unfortunately, she died following the operation. The specimen is also at the University.

Granulomatous lesions occur also independently in the colon. One film dates back a good many years. It showed a constricting lesion in the hepatic flexure region of the colon. At that time we called all of these hyperplastic tuberculosis and because of the giant cells, even though they are not characteristic of tuberculous giant cells, the pathologist concurred in the report that it was a hyperplastic tuberculosis.

Four years ago we had a chance to observe a patient with Dr. Ford in which we found one of these granulomatous lesions in the ascending colon. The individual has recovered without operation and is entirely well at the present time.

In closing I would like to call attention to the type of case that may confuse an observer although the history of frothy soapy stools should put one on his guard, and that is the case of non-tropical sprue whether true non-tropical sprue or due to carcinoma of the pancreas. In this case, of course, we know we get a segmental distribution of the barium throughout the intestine due to its upset physiology. In addition to that we get an edematous condition of the mucous membrane and submucosa, similar to what we have in gastritis, and eventually we get a loss of mucous membrane markings and undoubtedly ulceration. This type of lesion may simulate in its appearance the appearance of regional enteritis.

Dr. J. F. Corbett: I was greatly interested in this paper of Dr. Larson's, particularly with the x-rays that we saw. I am going to ask your indulgence while I report two patients that I took care of.

The first one showed a typical appearing granulomatous type. In this the large bowel was not particularly involved except exactly at the junction with the ileum. There there was a marked ulceration. This patient presented a sort of a colicky action of the bowel, such as you commonly see with carcinoma and therefore an x-ray was taken. In place of finding a carcinoma, the string sign was present although of not very great length, a very short narrowing of the bowel. At operation we found the terminal ileum was thin and atrophic and beyond this thinned out area there were multiple lesions of the beginning of the granulomatous spots.

I resected twelve inches of the small bowel and half of the cecum in this case. That was done one and one-half years ago and this patient has had no recurrence of any symptoms since then. Our attention probably was centered on this subject by the excellent paper that Jackson wrote and read at the Western Surgical Society meeting and before that we have probably all seen cases of terminal ileitis but had not applied that term.

The second case was of an entirely different type. In this, most of the disease was in the cecum. It was enormously thickened both from edema and infiltration of the submucosa so that I thought I was dealing with a carcinoma and did a radical resection. In this case there appeared to be what I described as a phlegmon of the large bowel and this showed signs of breaking down at the time that I operated. I did a very radical operation and the man made a good recovery.

Many times these cases are missed at operation. Many of the cases of terminal ileitis have been discovered after appendectomy has been done and oftentimes they even go on to autopsy before a diagnosis is made. That is why I think this paper is a matter of importance to us all.

Dr. Verne S. Cabot: In the past two years we have seen five of these cases; three were women and two men all within the age range of twenty-two to thirty-five years.

Dr. Morse has shown the films of a nurse who had multiple segmental involvements, complicated by internal fistulæ and secondary abscesses. The extent and character of her lesions precluded resection although drainage of abscesses was done, with but slight benefit, for she finally succumbed several months later in a state of exhaustion.

The first patient we saw ran contrary to the usual type in that this man had a gangrenous appendix in addition to an advanced regional ileitis of the terminal 30 centimeters. He is in good health at present despite the fact that periodic gastro-intestinal examinations show presence of the original area of involvement though with lessening narrowing of lumen and no symptoms referable to it.

The patients with advanced ileitis and especially those with multiple areas of involvements present a very serious problem.

Dr. Martin Nordland: Dr. Larson's discussion of regional ileitis has been very comprehensive. There is very little to add since he has reviewed the subject thoroughly.

Dr. Morse's remarks with reference to the x-ray findings in this disorder have added much to emphasize the value of this kind of an examination without which a diagnosis would be impossible.

I would like to make a few remarks with reference to the pathology in this lesion. In the first place no single microscopic study is sufficent to make a diagnosis. Pathologically it is classified as a granuloma and it is characterized by a chronic exudative inflammation with a marked invasion of p.m.n. leukocytes, similar to a chronic lymphangitis. There is a conspicuous fibrous infiltration of all the coats as well as a marked thickening of the mesentery together with an acute adentitis. Miliary abscesses are common in the walls, which accounts for rupture of the viscus and the formation of fistulæ. Grossly, there is a marked involvement of the peritoneum which accounts for the wide adhesions between the affected segment of the bowel and surrounding structures.

As Dr. Larson has pointed out, the decision of a primary section depends upon the condition of the patient. No immediate resection should be done in the debilitated patient.

FRACTURES OF THE METACARPALS AND PHALANGES*

Inaugural Thesis

Kenneth Fritzell, M.D.
Minneapolis

Because fractures of the metacarpals and phalanges are not always given the consideration they deserve, and in order to compile concrete evidence of the end results of treatment of these injuries, I have studied a series of fractures seen at the Minneapolis General Hospital and in private practice. The group studied for estimation of end results consists of 151 patients, forty-nine of whom returned for examination. These latter represent fifty-one injuries, forty-seven of which were simple fractures, two were compound fractures, and there were two dislocations. Two open operations were done; one an osteotomy for dorsal angulation of the metacarpal shaft, the other an open reduction of a metacarpo-phalangeal dislocation.

Most of the fractures occurred in males during the active years of life and there was an overwhelming predominance of injuries to the right hand.

The metacarpals were the site of twenty-five of the fractures, ten of these being in the first metacarpal and of these ten all involved the base. The fifth metacarpal was fractured eight times and the second and fourth three times each. Of the fractures of the metacarpals other than the first, eight occurred in the shaft and seven in the head.

The phalanges presented twenty-four fractures, seven of which were in the thumb and of these, five involved the proximal phalanx.

In the fingers, eleven fractures were in the proximal phalanges and three in the middle phalanges and three in the distal, a total of seventeen.

Of the two dislocations, one was at the metacarpophalangeal joint and one at the proximal interphalangeal joint.

Injuries to the epiphyses are not common and none appear in this series.

There were only two compound fractures studied. The presence of open wounds in fractures of the bones of the hand is a serious problem and the presence of such soft part damage increases the morbidity. It is not the purpose of this study to concern itself with treatment of soft tissue injury.

The diagnosis of fractures of the bones of the hand is largely the result of evaluating the history with attention being paid to the actual mechanism involved. Symptoms play a prominent part and a story of proper mechanism followed by adequate symptoms should indicate the need for proper x-ray study. In the absense of obvious deformity, physical examination has no characteristic indicative of fracture. Swelling and discoloration are common in all injuries of any degree involving the hand.

Healing of fractures of the phalanges is peculiar in that clinical disability is terminated long before roentgen study indicates union. Rider, and Smith and Rider, who studied the x-rays of one hundred consecutive cases of phalangeal fracture, state that the average time for healing was five months, the line of fracture being most distinct thirty days after the injury. Clinical healing occurs in about one-fourth of the time needed for healing from a roentgen standpoint.

In a general way, early mobilization is necessary, the estimate of healing being based on clinical experience. There are no non-unions in the cases in this series but at present we have under our care a patient with at least delayed union in a badly compounded fracture of the proximal phalanx.

Fractures of the terminal phalanges are frequently compounded and treatment is directed chiefly to the soft parts. It is worth considering that the nail is a fairly efficient splint and where practicable should be retained. Short splints of almost any type will suffice for treatment of fractures of the tuft or the shaft, but fractures of the base at the tendon insertions deserve extra care. Hyperextension or hyperflexion, depending on whether the chip is from the dorsal or volar surface of the base, should be maintained for from four to six weeks. It must be remembered that position should be strictly maintained during the change of dressing.

Treatment of middle phalanx fractures is frequently misdirected. The rule of placing the distal fragment in line with the proximal portion should of course be followed. The attachment of the sublimis tendon is at about the mid-portion of the shaft and consequently the direction of angulation will vary, depending upon whether the line of fracture is distal or proximal to the insertion. Fractures distal to the insertion are best treated in a curved splint while those proximal to the tendon attachment are best held in a straight dorsal splint.

The typical deformity in fractures of the proximal phalanx of the fingers is volar due to the pull of the interossei downward on the proximal fragment and the pull of the lumbricales on the dorsal aponeurosis, causing the distal end of the distal fragment to be pulled upward. With this in mind, it is obvious that splinting should be accomplished with flexion of the finger; in other words, placing distal fragment in line with the proximal. Jahss has described a method for fixation of fractures of the phalanges which seems to have some advantages. When the proximal interphalangeal joint is flexed to 60 degrees, which is the normal limit, the posterior articular capsule becomes tense and any further flexion will move the head of the phalanx toward the palm and so reduce the deformity. The finger is then held in place with adhesive strips. In fractures of the middle phalanges with anterior angulation, he straps the distal to the proximal phalanx with the interphalangeal joints in full flexion.

Fractures of the second to fifth metacarpals may be divided into those of the head or distal end, those of the shaft, and fractures of the bases. Fractures of the heads are most common and the deformity is well known. Transverse fractures of the shaft, too, have the displacement when present, of such nature that the knuckle is depressed and angulation is dorsalward. This is due both to the injuring force and the action of the interossei. Reduction should be done with particular care to disimpact when necessary, and may sometimes be accomplished with the use of a clamp as suggested by Murray. The hand is best put up in a posterior splint with padding over the angular deformity and pressure exerted under the head in order to maintain the correction. Bosworth has had good results in a fracture of the fifth metacarpal by fixing the distal fragment to the fourth metacarpal with two steel pins. Fractures of the metacarpal bases, unless the deformity is unusually marked, need only a posterior splint which includes wrist, hand and forearm.

Certain fractures of the shafts of the phalanges and metacarpals need skeletal traction for reduction or maintenance. It should be used whenever necessary, and is a great convenience in dressing soft-part wounds, enabling one to handle the tissues without disturbing bony alignment. Traction should always be applied with the same rules of direction in mind as when using other splints. I believe that it is undeniable that skeletal traction as opposed to adhesive or finger trap or finger nail methods is completely accepted.

Fractures of the proximal phalanx of the thumb have, in the textbook type of case, a deformity maintained by the action of the transverse and oblique adductors and therefore should be immobilized in flexion and adduction.

The first metacarpal is a site for a number of specific types of fracture. Those of the shaft and head need no further discussion, but those of the base are deserving of special consideration. Winterstein has investigated the architecture of the first metacarpal and finds that it varies with age. Essentially, however, the internal structure is fairly constant and it is obvious from the slide shown why true Bennett's fracture and that known as Rolando's fracture do occur.

A true Bennett's fracture, as described by him in 1881, involves the palmar portion of the base only and the fracture line angles into the joint. The resultant deformity is one of dorsal dislocation of the distal fragment.

A more severe fracture may involve the dorsal portion of the base of the bone as well, and the fracture line be more or less "Y" shaped. This is termed a Rolando fracture.

Bennett's fractures are best treated by abduction of the thumb with the thumb in the plane of the palm. Murray feels that fixation should be in adduction and flexion parallel to the plane of the extended fingers. He feels that any limitation of motion in the metacarpophalangeal joint is then in abduction and extension, which are less important. Open reduction with nailing of the fragments has been tried by Lambotte in 1908 but the success of this procedure is questionable.

In the Rolando type of fracture, abduction is all that is usually necessary. The prognosis here is better than in the true Bennett form.

These cases were collected from the Out-Patient Department at the Minneapolis General Hospital, but do not indicate the true number treated, as many patients after receiving initial treatment in the emergency ward do not return for further care for what they may regard as a trivial injury. For this reason also, it is apparent that only the relatively severe fractures are here included. Injuries in which damage to soft parts is a major element are seen in the general surgical clinic, and for this reason many of this type were not found.

Treatment in these cases was started by a number of individuals. No constant method has been applied and almost all methods of fixation have been used. All cases requiring manipulation under general anesthesia or the use of skeletal traction have been treated as resident patients.

For all these reasons it is difficult, if not impossible, to reach definite conclusions or estimates.

Comparative figures for morbidity are not common. Ziegler found 24.9 per cent invalidism in 403 cases of fractures of the fingers. The figures obtained by Wilson at the Massachusetts General Hospital are illustrated by the slides. He has developed a method of recording end-results which will also be illustrated. He estimates anatomical, functional and economic loss and fixes the classes of rating arbitrarily. Our figures were fixed by the same limits but there is obvious discrepancy in the estimates made by different observers. It has also been impossible to estimate economic disability in our patients.

For various reasons, then, it is not satisfactory to compare statistics, but the comparison may serve to stimulate the recording of end-results in some standard manner.

Our findings are illustrated in the charts shown. Of the ten fractures of the base of the first metacarpal, only one had disability—it amounted to 33 per cent. These good functional results obtained in spite of the presence of only fair anatomical results in six cases.

The cases falling in the classes in which functional disability ranged from 37.5 to 87.5 per cent were distributed among all the bones, no one site or method being responsible for poor results. The impression gained is that the nature of the bone injury itself has little to do with the terminal disability but that a mechanism of injury which includes damage to soft parts, or a treatment which includes too long immobilization, are factors which predict a poor functional result.

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FRACTURES OF THE OS CALCIS IN CHILDREN

Report of Two Cases in Children Less than Six Years of Age

U. Schuyler Anderson, M.D. (by invitation)
Minneapolis

The incidence of fractures of the os calcis in children less than ten years of age is rare. Only one case was reported in the literature of the past twenty years; that of Cotton[3] cited in his book "Dislocations and Joint Fractures." Furthermore, a survey of the literature leads one to believe that the fracture is extremely infrequent in children more than ten years of age.

Bode,[1] in reviewing two hundred and thirty cases of fractures of the os calcis, found that no patient was less than fifteen years of age. The youngest of sixty-four patients with fractures of the os calcis treated by Yoerg[6] in the past four years was sixteen years of age. There were only three children in a group of seventy-two patients with fractures of the os calcis studied by Cahill.[2] He stated that the rarity of this fracture in children is probably due to the elasticity of the child's foot, which is formed chiefly by cartilage.

However, an examination of the ages of patients with fractures of the os calcis admitted to the Minneapolis General Hospital* indicated that the fracture is not uncommon in older children from ten to fifteen years of age. From 1931 to 1938 seventy-two patients with fractures of the os calcis were admitted to the hospital, eight (11 per cent) of whom were children ranging in age from eleven to fifteen years (Table I).

TABLE I. EIGHT CASES OF FRACTURES OF THE OS CALCIS IN CHILDREN FROM THE MINNEAPOLIS GENERAL HOSPITAL

Case	Sex Age	History	Physical Findings	First Roentgenogram	Treatment	Last Roentgenogram	Final Results
No. 1 R. W.	Male 12 yrs.	Tractor wheel passed over left foot.	Left foot swollen and discolored	Fissure fracture left os calcis	Moulded plaster splint	Union	Normal function, no disability
No. 2 R. B.	Male 15 yrs.	Fell 15 ft.	Swelling, discoloration of both feet	Crush fractures of both os calces	No manipulation. Circular plaster casts	None	Unable to learn
No. 3 J. Z.	Male 13 yrs.	Fall from roof of home	Swelling, tenderness of left heel	Fissure fracture of left os calcis	Circular cast. Walking iron cast	None	Unable to learn
No. 4 D. P.	Male 13 yrs.	Fall from second floor window	Swelling, discoloration of both feet	Crush fracture of left os calcis	Bochler's method	Union in malposition	Good functional results. No disability
No. 5 E. S.	Male 13 yrs.	While diving struck left heel.	Swelling, discoloration of left heel	Crush fracture of left os calcis	No manipulation. Walking iron cast	Union in malposition	Good functional results. No disability
No. 6 R. P.	Male 11 yrs.	Fall from sign board	Tenderness of left heel	Crush fracture of left os calcis	No treatment	None	Unable to learn
No. 7 E. M.	Male 14 yrs.	Fall from moving truck	Swelling, discoloration of left foot	Fissure fracture of left os calcis	Circular cast	Union	Normal function. No disability
No. 8 L. M.	Male 14 yrs.	Fall from box car	Slight swelling of right heel	Crush fracture of right os calcis	Yoerg's method	Union in good position	Excellent functional results. No disability

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*From the Fracture Service, Minneapolis General Hospital, Minneapolis, A. A. Zierold, Chief.

The roentgenologic diagnosis of fractures of the os calcis in children depends upon a knowledge of the developmental anatomy of the child's foot. The three bones which are present in the tarsus at birth are the os calcis, talus, and cuboid bones. The nucleus of the body of the os calcis calcifies, according to anatomists,[4] during the sixth month of fetal life. The epiphysis (apophysis) calcifies between the seventh and tenth years, and unites with the body of the os calcis between the thirteenth and twentieth years.

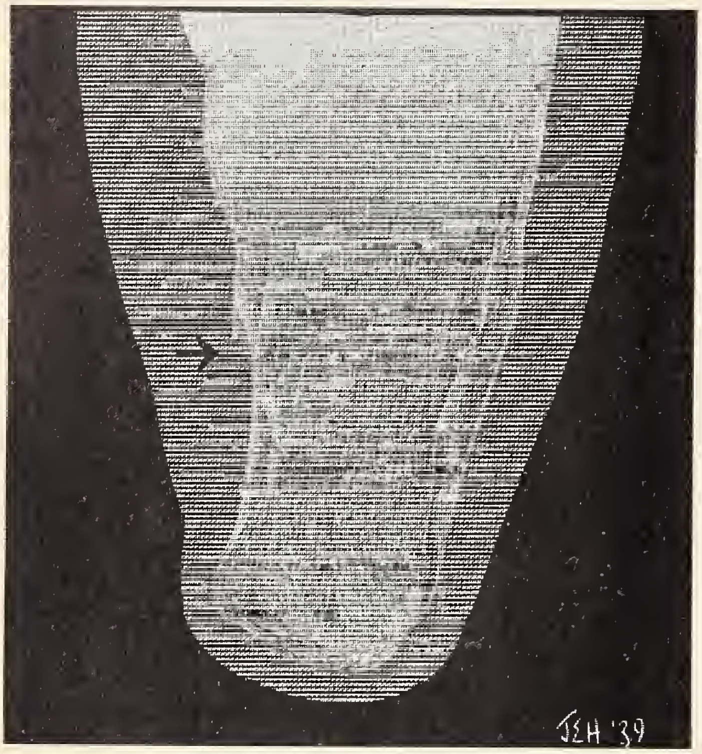

Fig. 1. Case 1. Interpretative drawing of superior-inferior roentgenogram of os calcis of child, aged five years. Arrow on medial side indicates fracture with lateral displacement of inferior fragment.

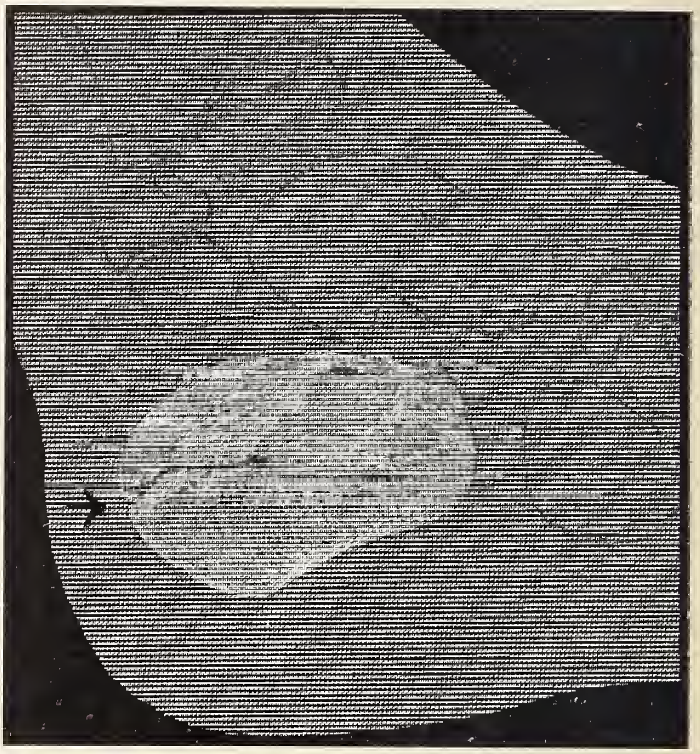

Fig. 2. Case 2. Interpretative drawing of lateral roentgenogram of os calcis of child, aged three years. Arrow indicates site of fissure fracture.

Köhler[5] stated that occasionally the body of the os calcis calcifies from two centers, the first of which centers is laterally situated, calcifying in the fifth fetal month, and later becoming the trochlear process of the os calcis. The second center calcifies in the seventh fetal month and usually fuses with the first center before birth. This fusion, however, does not always take place, and a separate epiphysis of the trochlear process forms and persists until puberty. The epiphyseal line of this process may be mistaken for a fracture.

The epiphysis (apophysis) of the os calcis infrequently has two or three centers of calcification, and when this condition obtains it may be confused with a fracture of the epiphysis. Roentgenologic examination of both heels avoids such mistakes, since the centers of calcification are usually the same on both sides.

Another point to be observed in the roentgenogram is that the posterior contour of the growing os calcis in the lateral view appears irregular, indented, and wavy. This appearance, too, may be misinterpreted as a fracture.

In children, as in adults, two general types of fractures of the os calcis can be differentiated: avulsion fractures of the tuberosity, and fractures of the body. Avulsion fractures of the tuberosity in children are extremely rare.

Fractures of the body of the os calcis may be separated into two general classes: crush fractures and fissure fractures. In crush fractures there is extreme comminution of the bone with flattening and lateral spreading. Fissure fractures may be comminuted, but there is no displacement of fragments.

Report of Cases

Case 1.—R. B., white, male, aged five years. This patient was treated by the author at the Northwestern Hospital in Minneapolis, where he was admitted on December 8, 1937. One day prior to admission he had jumped ten feet from the roof of a garage to the frozen ground. The left foot became swollen and discolored below both malleoli. Palpation of the heel caused severe pain. A roentgenogram (Fig. 1) showed a fracture of the left os calcis with lateral displacement and slight spreading. There was no apparent flattening nor loss of the normal tuberosity-joint angle.

The foot was elevated for four days to diminish the swelling, after which the heel was manipulated under ether anesthesia. A moderate amount of compression was made on each side of the heel with the os calcis clamp, resulting in excellent reduction. A slightly padded circular cast which was well moulded beneath the malleoli was applied from below the knee to the toes. The cast was removed three weeks after its application. A roentgenogram showed the fracture at this time to be united in good position. Partial weight bearing was begun two weeks later. Two months after the injury there was complete return of function with no permanent disability.

Case 2.—J. F., white, male, aged three years. This patient is the son of Dr. John M. Feeney of Minneapolis, who treated him at the Northwestern Hospital in August, 1938, and permitted the case to be reported in this paper. While riding on his brother's back, the child had fallen and struck his right heel on the floor. A roentgenogram (Fig. 2) showed a fracture line extending transversely through the long axis of the os calcis. There was no displacement or impaction. A circular cast was applied from below the knee to the toes. Three weeks later the cast was removed, and in another three weeks full weight bearing was resumed. The function of the foot was normal.

Comment

Five of the eight children who were treated at the Minneapolis General Hospital were observed three to nine months after discharge from the hospital. These five children had good functional results with no permanent disability, although in two instances the fractures healed in malposition. Yoerg's method of reduction produced excellent anatomic and functional results.

Conclusion

In children, fractures of the os calcis occur which are similar in type to those in adults. Such fractures usually result from a fall from some object several feet in height. This fracture is rare in children less than ten years of age but not uncommon in children between ten and fifteen years of age. Two cases in children less than six years of age are reported.

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Discussion

Dr. Otto Yoerg: I have enjoyed hearing Dr. Anderson's paper. Fractures of the os calcis account for about 2 per cent of all fractures. Most of them occur in the forties and fifties, and are more common in the working man, who is subjected to the danger of falling from a height. The fracture, however, can occur at any age but rarely occurs in the young.

Dr. Anderson's case is of interest as I have been unable to find in the literature a fracture of the os calcis in a child five years old.

Fractures of the os calcis may occur from other causes. I made a reduction on a man at the General Hospital who was struck by a car. He was thrown to the pavement and slid along on the pavement striking his heel forcibly on the curb. Another case was that of a young woman who was riding in the front seat of a car that was involved in a head-on collision. The impact of the heel on the footboard produced a badly comminuted fracture of the os calcis.

The bones in children are soft and pliable, as Dr. Anderson stated. This undoubtedly accounts for so few fractures in children, as certainly every child delights in jumping from a height.

Fractures of the os calcis in children are, fortunately, not severe, and there is seldom a crushing of the posterior joint surface. The end-result in youngsters is much better and convalescence shortened. Disability very rarely results.

LYMPHOSARCOMA OF THE ILEUM

Report of a Case

W. H. Rucker, M.D., F.A.C.S. (by invitation)
Minneapolis

Primary lymphosarcoma of the intestine is rare. Staemmler, in 1923, checked 54,000 autopsy records from German and Austrian hospitals and found only thirty-three cases. Margaret Smith discovered only three lymphosarcomas involving the intestines and only one of the small intestine in about 18,000 autopsies recorded at the University of Minnesota from 1928 to 1938. Ullman and Abeshouse, after an exhaustive study of the literature in 1932, included one case of their own and noted 375 cases. In checking over the literature from 1932 to date there are approximately thirty-five isolated cases recorded, making a total of 410 cases.

Lymphosarcomata are malignant tumors originating in lymphatic tissue and composed of lymphocytic cells in small amounts of reticulum. They infiltrate the local tissues and metastasize to the regional lymph nodes.

In the bowel they arise in the submucosa and grow towards the serosa, invading the muscularis. They very rarely penetrate the serosa and only cause ulceration of the mucosa through pressure, loss of blood supply and necrosis.

They begin as indurated areas in the intestinal wall and are likely to follow around the wall, forming a tubular growth and causing a constriction of the lumen. Many times, however, by weakening the muscular coat they cause an aneurysm of the gut. Polypoid growths may develop within the intestine. From the primary growth in the gut wall the tumor soon extends to the lymph glands in the mesentery and in the late cases by way of the blood stream to distant organs.

Paralleling the lymphoid distribution in the intestines, these tumors are twice as common in the small intestine as in the large and occur most frequently in the region of the ileocecal valve. They have a predilection for the first, second and fourth decades of life but have been reported from birth to 85 years. They favor the male 5 to 2 and the white over the negro 7 to 1.

The etiology of this neoplasm is unknown. However, a number of cases have been reported in which it has followed blows and injuries to the abdomen. Arising as it does most often in the region of the ileocecal valve where there is a large amount of lymphoid tissue and where there is a stasis or slowing of the bowel stream, one might easily theorize that infection and trauma could play a definite rôle. The leukocytosis and increased polymorphonuclear count which is practically always present would also seem to substantiate this thought. Desjardins, in his observation of a large number of cases of lymphosarcoma, has found it closely associated with chronic infection and feels that this may be the causative factor.

The symptoms are most often those of obstruction or appendicitis. The laboratory findings commonly disclose a moderate leukocytosis, an increased polymorphonuclear count and some grade of anemia. The x-ray gives no definite picture but may suggest malignancy. The tumor can rarely be differentiated from carcinoma. Treatment depends upon the stage of metastasis. If early, radical resection, followed by roentgenotherapy. If late, deep x-ray therapy. The prognosis is unfavorable. Early operation followed by x-ray therapy gives hope of a five-year cure in one out of eight or nine cases.

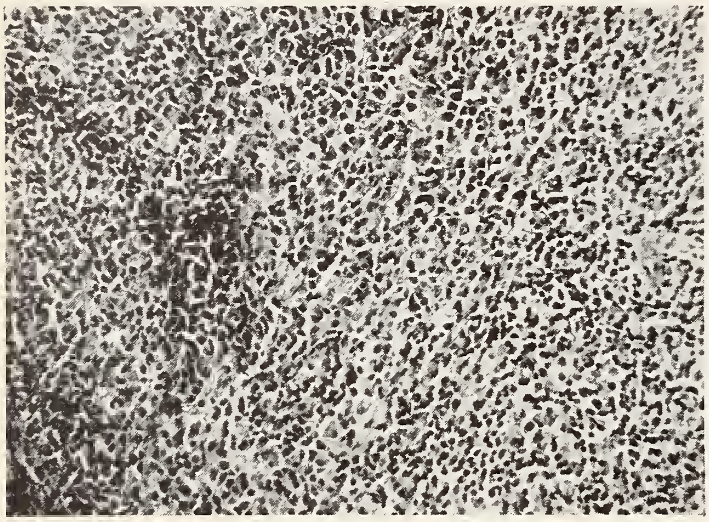

Fig. 1. Microscopic section through lymph gland showing the lymphocytic cells filling the gland entirely and destroying the normal gland structure.

Case Report

This is the case of a white unmarried girl of English-German descent, nineteen years of age, unemployed and living with her parents. She was admitted to Northwestern Hospital during the evening of October 19, 1938.

History of Present Illness.—For the past three weeks she had had attacks of nausea and vomiting with indefinite pain in the upper abdomen, which were present during the day but were not so severe as to keep her awake at night. The type or amount of food she ate seemed to have little or no effect. She performed her duties at home as usual. One week previous to admittance to the hospital her doctor found no elevation of temperature and no definite diagnosis was made. An alkaline mixture was prescribed and she was given a soft diet. She was somewhat relieved but on October 19 she awoke in the morning with abdominal cramps, vomiting severely with each pain. These attacks at times were only 5 minutes apart and she thought she had vomited at least twenty times. Her bowels moved normally, twice during the day.

Past History.—As a child she had measles and whooping cough. At five years of age she had "kidney trouble" and was treated for three weeks. Following this, she had an abscess in the axilla. During the same year her tonsils and adenoids were removed. Since then her general health has always been good. She has never had any major operations nor does she remember any injuries to her abdomen.

Her appetite has always been good, her bowels move normally and she has had no food aversion or distress. She has never noticed blood in the stools. On careful questioning she stated that during the past year she had had a considerable number of vomiting spells, sometimes twice a week and then not again for two or three weeks. She says she considered it a habit and thought nothing of it.

Since the attack of kidney trouble at five years she has had no symptoms pointing to genito-urinary disease.

Menses began at fourteen, have occurred at twenty-eight-day intervals, and lasted five or six days. She has had no vaginal discharge.

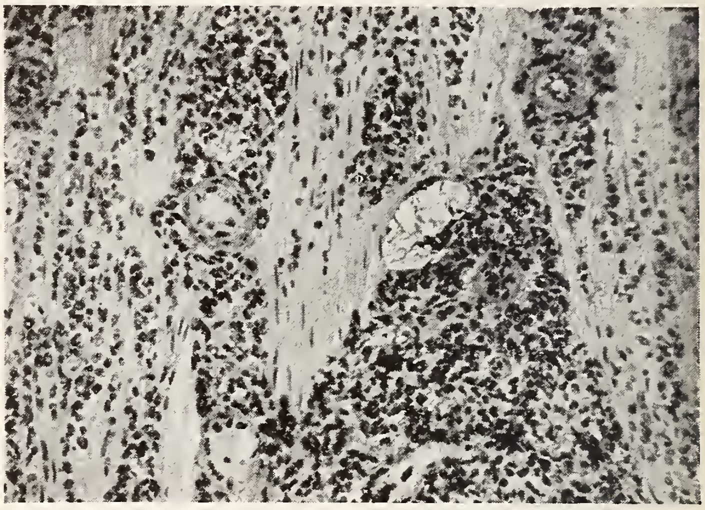

Fig. 2. Microscopic section through tumor showing lymphocytic cells invading the muscularis.

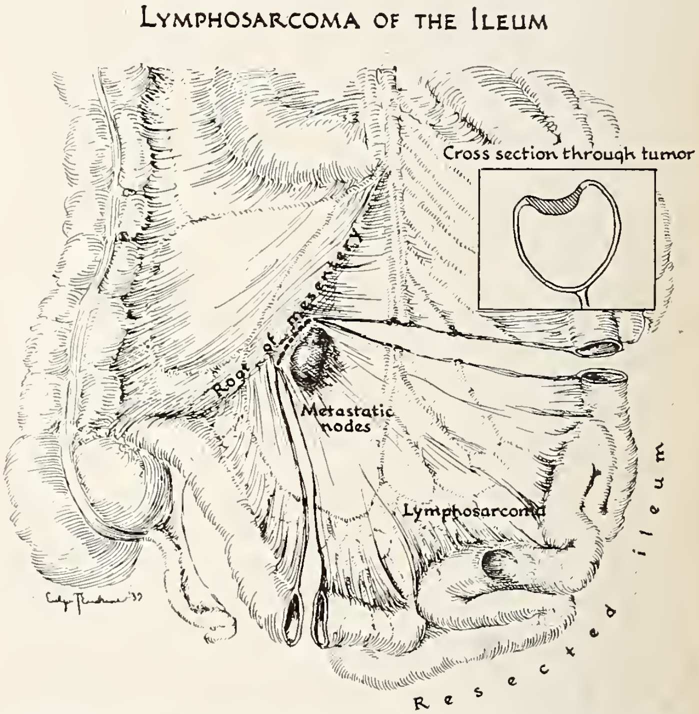

Fig. 3. Drawing showing the location of the tumor and metastatic nodes and the length of ileum, with its mesentery resected.

There has been no noticeable loss of weight.

Family History.—Her father, mother and two sisters are living and well. There have been no deaths in the immediate family and there have been no malignancies in any blood relatives.

Physical Examination (Oct. 20, 1938).—Temperature 98.4°, pulse 78, blood pressure 118/65, respiration 20.

A young, well nourished female, lying in bed, evidently not in pain, with rough papillary acneiform lesions on the face. Head, neck and chest were normal.

The abdomen was soft but there was a moderate tenderness on the left side, most marked just above the umbilicus. There was no rigidity, muscle spasm or mass palpable.

On entrance to the room, October 21, 1938 (9:00 a. m.), I found her in distress. She stated that the pain had localized in the right lower quadrant and had been severe since early in the morning. She had had nothing by mouth during the previous day and had been given proctoclysis and there had been no vomiting.

The abdominal picture had changed completely. She was exceedingly tender over McBurney's point and over the entire right lower quadrant. There was definite muscle spasm and marked rigidity. A diagnosis of acute suppurative appendicitis was made.

Laboratory Findings.—White blood count 10/19/38, 16,250 (on admittance); 10/20/38, 12,500; 10/21/38, 12,600 (day of operation); 10/24/38, 7,800. Wassermann: negative. Hemoglobin—10/20/38, D. 68 per cent; N. 70 per cent. Red blood count, 10/20/38—3,530,000; differential: polynuclears 72 per cent, large mononuclears 8 per cent, lymphocytes 20 per cent. Urine: negative except for slight albumin.

Operation.—Operation was performed October 21, 1938, at 11:15 a. m., using gas and ether. The abdomen was entered through a right rectus incision. The appendix was located and inspected. It was injected and showed a mild degree of inflammation, not enough in our estimation to account for the pre-operative picture. Further exploration found no abnormalities in the stomach, duodenum, gallbladder, or pelvic organs. However, a lump the size of a walnut was encountered in the mesentery of the ileum. On inspection of the gut opposite to this, an indurated area was found in the apex of its wall, at a point 18 inches from the ileocecal valve. The area or plaque was the size and shape of a large overcoat button and caused a dimpling of the gut. It was whitish in color and moderately hard. A section was taken from the gland from which a definite diagnosis could not be made. At Dr. Yoerg's suggestion intestinal clamps were then placed on either side of the tumor and a biopsy of the tumor itself was made. When the diagnosis of malignancy was reported a resection of 24 inches of small gut was made, removing the tumor and the mesenteric nodes, and a side-to-side anastomosis established. There was a stub of six inches of ileum left proximal to the ileocecal valve.

The wound was closed in layers and two tension sutures were used in the fascia.

Pathological Report.—Gross: Specimen consists of a section of the small bowel with a round ulcerated area approximately 2 cm. across. The edge is moderately smooth and the base is very firm but a little bit soft and light colored. In the mesentery are three large glands. Microscopic: Sections through the intestinal tumor show dense masses of cells resembling those of germinal centers. These are invading the mucosa and muscularis markedly. The normal gland structure is lost and this same type of cell fills the glands entirely. The mitoses are very numerous. There is a suggestion of reticulum. The mucosa at the edge is markedly polypoid.

Diagnosis: Lymphosarcoma of the germinal cell type.

Post-operative Course.—Nasal decompression was used for one week. The wound healed by primary intention and the patient made a most uneventful recovery. She remained in the hospital fourteen post-operative days, left with her bowels moving normally, on a soft diet and in no distress of any kind.

She remained at home ten days and then was referred to the x-ray department for deep therapy.

When seen at the office May 1, 1939, five months after operation, she had gained ten pounds in weight, appeared in excellent health, was having no gastro-intestinal symptoms, nor was there any evidence of recurrence of the tumor.

Summary

A case is described in which the clinical picture and laboratory findings were strongly indicative of acute appendicitis but which at operation proved to be a small primary lymphosarcoma of the wall of the ileum, with involvement of the adjacent mesenteric lymph nodes.

BOARD OF MEDICAL EXAMINERS

List of Physicians Licensed

(Continued from page 857)

Stromme, William Brown—U. of Minn., M.B. 1939, Minneapolis.

Studer, Donald James—U. of Minn., M.B. 1938, Minneapolis.

Subby, Walter, Jr.—U. of Minn., M.B. 1939, Saint Paul.

Travis, James S.—Rush Med. Col., M.D. 1938, Fargo, N. D.

Trimingham, Hugh Gerald—Loch-McGill, M.D. 1937, Rochester.

Weible, Ralph Darrow—U. of Minn., M.B. 1938, Minneapolis.

Wellner, Theodore Otto—U. of Minn., M.B. 1939, Minneapolis.

Wood, Benjamin J.—U. of Pittsburgh, M.D. 1938, Rochester.

Wozencraft, Jean Paul—U. of Cincinnati, M.B. 1938, M.D. 1939, Rochester.

Wright, Donovan George—U. of Minn., M.B. 1938, M.D. 1939, Minneapolis.

By Reciprocity

Adair, Albert Franklin, Jr.—U. of Tenn., M.D. 1934, Saint Paul.

Anderson, David Perrin, Jr.—U. of Pa., M.D. 1934, Austin.

Kent, Herbert Knight—Loyola U., M.D. 1929, Lansing.

Kisner, Paul—Washington U., M.D. 1935, Minneapolis.

National Board Credentials

Clapp, Stewart—Geo. Wash. U., M.D. 1937, Chevy Chase, Md.

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of October 11, 1939

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, October 11, 1939. Dinner was served at 7 o'clock and the meeting was called to order by the president, Dr. Carl B. Drake, at 8:10 p.m.

There were fifty-three members and four guests present.

Minutes of the May meeting were read and approved.

Dr. Herbert Jones, of Minneapolis, read the following Memorial to Dr. Chester M. Carlaw, and a motion was carried that it be spread on the minutes of the Academy and a copy sent to the family.

Chester Milton Carlaw

1865-1939

Dr. Carlaw was born in Toronto, Ontario, Canada, on June 5, 1865. His father, Major John A. Carlaw, was of Scotch Presbyterian ancestry. Both his father and grandfather were distinguished citizens of Toronto and were very active in the civic, commercial, and religious affairs of the city. His mother, Susanna Chester, was of English descent and came from Montreal, Canada.

Dr. Carlaw was educated in Guelph College and graduated in 1883. He then went to Albert University in Belleville, Ontario, graduating in 1887. He continued his course at McGill University in Montreal, from which college he was graduated in 1891. He was licensed in New York and Minnesota and came to Minnesota in 1891 to enter the practice of medicine.

He was married on August 5, 1891, to a daughter of Dr. Irwin Dorland Bogart of Campbellford, Ontario.

Dr. Carlaw was a member of Asbury and Northwestern Hospital Staffs, Hennepin County Medical Society, Minnesota State Medical Society, American Medical Association, and also the Minnesota Academy of Medicine. He was a member of First Presbyterian Church in Minneapolis.

During his entire life Dr. Carlaw was intensely interested in agriculture and spent his leisure time in gardening and raising fine livestock.

Dr. Carlaw was a valued member of this community. His kindly, genial disposition endeared him to his patients; and his candid, honest opinions brought him the respect of the medical profession. He died on January 7, 1939, after a long life devoted to the alleviation of suffering.

The Necrology Committee,
Herbert Jones, M.D.

The Secretary read a letter from Dr. J. T. Christison, of Saint Paul, asking that his name be transferred to the Senior Membership list. This had been approved by the Executive Committee. Voted on and accepted by the Academy.

The scientific program followed.

Dr. Lee W. Barry, Saint Paul, read his inaugural thesis entitled "A Brief Historical and Technical Review of Cesarean Section." (To appear later in Minnesota Medicine.)

VOLVULUS OF THE COLON*

Report of Two Unusual Cases

A. E. Benjamin, M.D.
Minneapolis

Volvulus of the colon constitutes about 10 per cent of the cases of obstruction of the bowel. The sigmoid is most frequently affected, the transverse colon and cecum less often. It may occur in the acute form or there may be a history of recurring attacks with symptoms of obstruction of the bowels ending in a positive torsion of the bowel and complete obstruction.

James A. Cahill, Jr.[1] states that "chronic intestinal stasis with traction on the mesentery predisposes to this condition." Volvulus of the colon has been attributed to constipation, congenital bands, a long mesentery, adhesions, rough diet, appendicitis, and former operations.

Ladd[4] states that in instances in which the development has been arrested before the parietal and visceral peritoneum were fused, the mid-gut remains attached to the posterior abdominal wall by only a very small area at the origin of the superior mesenteric artery. Under these circumstances, a volvulus of the mid-gut is particularly liable to develop.

Incomplete rotation of the right colon or cecum mobile may be causes. James[3] reports a case of interest not only from the point of view of the youth of the patient but also because it presented itself as an acute obstruction on the ninth day after an otherwise uncomplicated appendectomy.

It is an affliction of middle life mainly, and its incidence in male and female is about equal up to twenty years of age. It occurs about four times as often in men as in women after twenty years of age, probably due to less space for the bowel in men and the character of the diet eaten by the male. There is gas and fluid distention of the loop involved and often gas distention of the proximal intestine. The ileocecal valve occasionally prevents the regurgitation of gas into the small intestine, however. The circulation, when interfered with, results in a serosanguinous abdominal exudate and constitutional symptoms. The twist is usually clockwise and may be from 90 to 720 degrees. When of the right side, a reverse twist occasionally occurs.

The mortality of torsion of the intestine is recorded as about 50 per cent but is greatly increased when necrosis occurs and resection becomes necessary.

The symptoms of torsion of the colon are those of obstruction. They are modified according to the location, duration, and degree of the obstruction. In the chronic form there have been former attacks of abdominal pain, constipation alternating with diarrhea, with attacks of nausea and vomiting, distention of in-

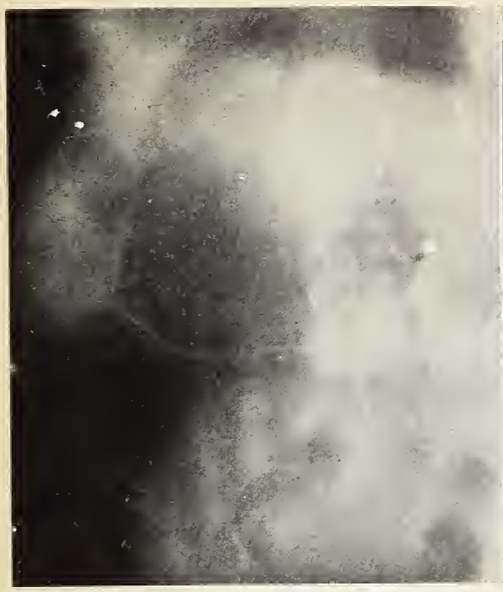

Fig. 1. Case 1. September 3, 1938. The large air-distended segment of bowel in the upper abdomen is the proximal part of the colon. At this time this was erroneously interpreted as being distention of the stomach.

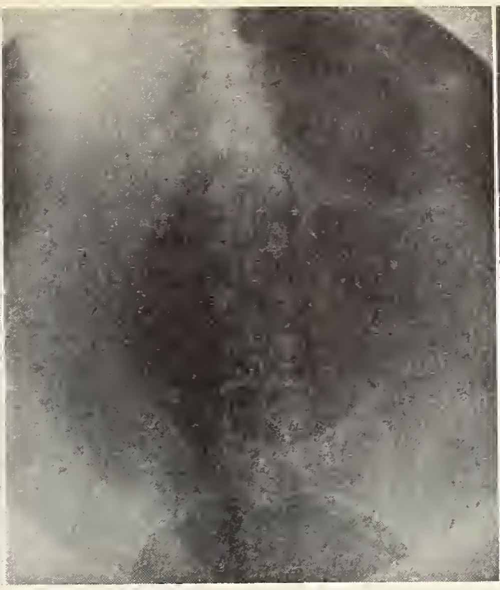

Fig. 2. Case 1. September 9, 1939. Marked air distention of the intestinal tract. Two loops of bowel in the upper abdomen are markedly distended.

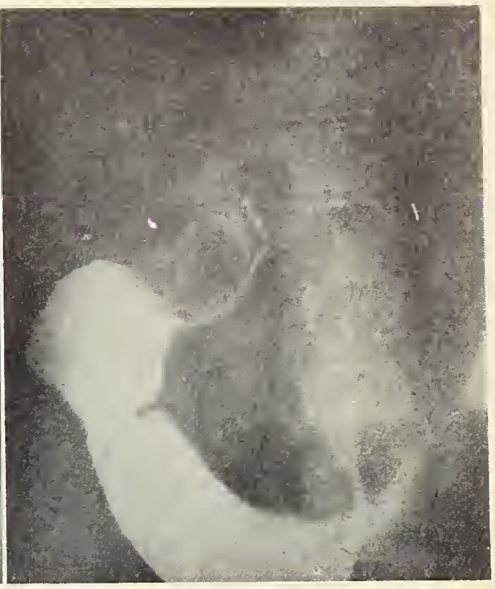

Fig. 3. Case 1. September 9, 1939. Barium enema examination shows the twisted appearance of the proximal part of transverse colon. This corkscrew-like twisting of the bowel is apparently characteristic of volvulus.

testinal loops, and obstructive signs. The symptoms may resemble those of internal hernia, mesenteric thrombosis, pancreatitis, intestinal adhesions, appendicitis, diverticulitis, torsion of the broad ligament or pedunculated cyst.

The diagnosis is less difficult when an x-ray plate is taken before and after a barium enema. Nasal suction should be instituted early as it facilitates the diagnosis and lessens the discomfort of the patient. Intravenous glucose and saline should be used in every case of obstruction until a diagnosis is made or relief is given. The mortality may thus be greatly reduced.

Surgical treatment should not be postponed, even though the patient seems comfortable after using nasal suction, if the x-ray shows complete obstruction, no gas is expelled, and the distended loop is not decreased.

Grace[2] states as follows:

> "A survey of the literature shows that some three to five cases of volvulus of the cecum are reported each year; practically all of these are in foreign journals. The comparative rarity on this continent may be judged from the fact that Sweet, when reporting a personal case, was able to locate records of only six cases in the Massachusetts General Hospital in a period of 57 years; this means approximately one example of the acute and recognized variety each ten years on the average. It has not been possible to find any record of a single case in London (Ontario), either among the records of the Victoria Hospital or from a personal canvass of a number of surgeons and pathologists."

Leonard and Derow[5] report as follows:

> "A volvulus of the cecum and ascending colon that had been operated on fifteen years previously for a volvulus of the same portion of the colon. This patient succumbed after a Mikulicz operation. There were three other cases of involvement of the ascending colon and cecum. Two of these were treated by simple untwisting. In the third there was a recurrence four months after operation. At the second operation it was deemed necessary to resect the involved portion."

On account of the comparative rarity of right-sided volvulus of the colon, I desire here to report a unique case of volvulus of the cecum, ascending and part of the transverse colon; also a second unusual case of volvulus of the sigmoid and part of the descending colon; and to contrast these two forms of torsion of the colon.

Cases

Case 1.—Mrs. M. P., white, aged seventy-six, housewife, was admitted to the hospital September 9, 1939. Her height was 5 feet 4½ inches and weight about 185 pounds. Her eyes, ears, nose and throat, as well as heart and lungs, were normal. The abdomen was unusually prominent and greatly distended, with much adipose tissue in the abdominal wall and gas in the intestine.

Parents are both dead. One brother is living, but has tuberculosis. Two sisters are living and well. Her husband is living, but has asthmatic attacks. Three children are living and well.

The patient had measles as a child; influenza in 1932; hernia operation in 1914. She broke her right leg above the knee in 1928 and while in the hospital had a severe attack of abdominal cramp, constipation and diarrhea. A tumor was removed from the back of the right knee several years ago. In 1934 she complained of a painful area and a small mass in the right breast which had been present about a month. There was some discharge from the nipple. The tumor and axillary glands were removed in March, 1934; the pathologist's report was medullary carcinoma. The wound healed very slowly, with considerable discharge from the wall of fat breaking down. Several deep x-ray treatments were given, and to date there is no sign of recurrence.

While in the hospital she became constipated and complained of abdominal distention, pain and vomiting, followed by diarrhea. She gradually recovered and remained comparatively well until September 1, 1938, when she sustained an intertrochanteric fracture of the right hip. There was moderate upward displacement of the lesser trochanter; otherwise the fragments were in good position. The third day in the hospital she began to complain of gastric distress with nausea and vomiting. Intravenous glucose and salines, surgical pituitrin and nasal suction were instituted.

Radiographs of the abdomen (Fig. 1) on September 3, 1938, showed marked distention of the stomach with air and also considerable air distention of the intestinal tract. The findings were those of a paralytic ileus. She continued to have more or less gastric distress until the tenth hospital day, when the symptoms gradually subsided. The patient was discharged after eighty-nine days in the hospital. She got around at home very well, on crutches.

While at home the patient experienced a severe attack of unilateral herpes zoster along the course of the right twelfth dorsal nerve, and the eruption extended from the spine downward and forward over the front of the abdomen for about twenty-four inches. Recovery from this was slow and painful, the eruption lasting about four months. During the latter stages of that complaint she experienced another attack of extreme constipation, pain and distention of the abdomen, with nausea and vomiting and, later, diarrhea. The symptoms were those of bowel obstruction, but, being averse to going to the hospital, some chances were taken. She finally recovered, except that her abdomen was unusually large from what seemed to be a thick-walled distended colon, and considerable pain was occasionally experienced in areas along the upper right abdomen where the herpes had affected her. She was up and about on crutches and occasionally went out riding.

On September 6, 1939, she began to have some abdominal pain which she attributed to food taken the evening before. She had been an unusually heavy eater and ate rich and coarse foods occasionally, and did not heed past warnings in regard to her diet. Her symptoms gradually became worse. She sought the advice of a physician late the next day and had a nurse try to relieve her by means of enemas. Very little gas was obtained. She had vomited considerably on the first and second days but this ceased the third day and the pain was less pronounced. Little or no gas or bowel evacuations occurred. The abdomen was distended and the percussion note was dull and tympanitic as of a thick-walled distended bowel. She was persuaded to go to the hospital, which she did early on September 9. She was much dehydrated; nasal suction was immediately started, as well as intravenous glucose and saline. These were continued until the fifth postoperative day. A flat radiograph of the abdomen (Fig. 2) and a barium enema (Fig. 3) showed that an obstruction existed at what seemed the hepatic flexure, possibly due to volvulus or adhesions. There were multiple diverticula of the sigmoid but no evidence of tumor. An operation was advised soon after these findings were noted, and, the patient being in fair condition, it was performed early on September 10, 1939, at St. Barnabas Hospital. At this time her temperature was 98.5°, pulse 85, regular and of fair volume. The urine showed a trace of albumin. The blood pressure was 180/145.

Nitrous oxide and ether and local anesthetic were used. At operation, the ascending and proximal half of the transverse colon were distended to a diameter of 5½ inches with a volvulus of about 540 degrees and a band 1½ inches wide constricting the mid-portion of the transverse colon. Blood and serum were found in the abdomen. The appendix was retrocecal and the gallbladder was apparently normal. The cecum was found in the upper left quadrant of the abdomen. (Alexius McGlonnan[6] states that the cecum may be found in any part of the abdomen.) Gas was removed from the distended colon with a needle. The obstructing band was cut and the volvulus untwisted. The cecum was brought up into the lower wound, sutured to the peritoneum and the rest of the wound closed with No. 1 chromic catgut for peritoneum and fascia, stay sutures also for the fascia, and dermal for the skin. Vaseline strip dressing was applied and a large catheter sutured into the cecum.

The patient's general health began to improve directly following the operation. The cecum was washed out several times a day for a few days. It was a large, thick-walled ball about 5 inches in diameter when first anchored part way out of the abdomen upon the theory that it would gradually shrink and could be safely returned to the abdomen, or, if it did not shrink, it could easily be removed. The catheter was removed in six days and the colon was kept empty by irrigations. The protruding cecum shrank to about 5 centimeters in diameter, its wall became less edematous and looked healthy. Her temperature was never over 101.5°, most of the time was 99°, and returned to normal. Her blood pressure gradually came down until it was 112/55. Her leukocyte count was 8,400 on September 11. Her hemoglobin was 62 per cent about the time of operation and then became about 70 per cent. The urine contained 1 plus sugar on September 11, two days after operation, but this disappeared.

Case 2.—This case is one that compares favorably with the first in interest and unusual findings, with the left side of the abdomen involved.

Carl S., aged seventy-three, married, is a real estate operator. His height is 5 feet 10 inches; weight 150 pounds. His habits are good.

He had "grippe" in 1890 and influenza in 1918; measles as a child; fracture of the right wrist in 1908; and a broken arm in 1930.

He came to me in 1935, and gave a history of having had more or less intestinal disturbance. As early as 1905 he complained of constipation and alternate diarrhea; he lost considerable weight, and there was more or less pain and distention in the abdomen not always relieved by enemas. He had used an enema tube connected with the water faucet to get sufficient pressure to get a bowel movement. There was no blood in the stools. In September, 1935, he had had pain in the abdomen for two weeks, with nausea and vomiting and considerable belching. The abdomen had been distended for two days and he had had no bowel movement for four days. He was sent to St. Barnabas Hospital. Radiographs were taken on September 13, 1935, before (Fig. 4) and after a barium enema (Fig. 5), and showed tremendous dilatation of the sigmoid colon, the diameter being approximately 6 inches. Above this there was moderate dilatation of the colon and no appreciable dilatation of the small intestine. There was obstruction of the colon in the lower half of the sigmoid and the appearance of the lumen in this region was that of a volvulus. There was no evidence of new growth.

Examination in September, 1935, revealed essentially negative findings except that the abdomen was distended and tympanitic and markedly tender. No masses were palpable. The skin was pale and moist.

Laboratory: urine, amber, sp. gr. 1.022; albumin, trace; sugar, green reduction; microscopic: occasional pus cell, few blood cells, few epithelial cells. Blood pressure 182/96. Hemoglobin 74 per cent (Sahli); leukocytes, 9,800. Wassermann negative.

At operation, September 13, 1935, a median incision was made. There was found an obstruction of the colon above the rectum, due to volvulus, with dilatation of the sigmoid, ascending, transverse and descending colon to a marked degree. About a full turn of gut (360°) was found, but not complete obstruction to the circulation. The bowel was dilated to about 5½ inches in diameter, resembling a megacolon. Wangensteen[7] states that in most instances in which volvulus of the sigmoid occurs, an unusually large bowel or pseudomegacolon with a long mesentery is present.

Gas was removed from the colon with a needle and a rectal tube was passed into the gas pocket after untwisting the colon. Puncture made into the colon was closed with a Dulox purse-string. A rectal tube was left in situ, and the abdomen closed.

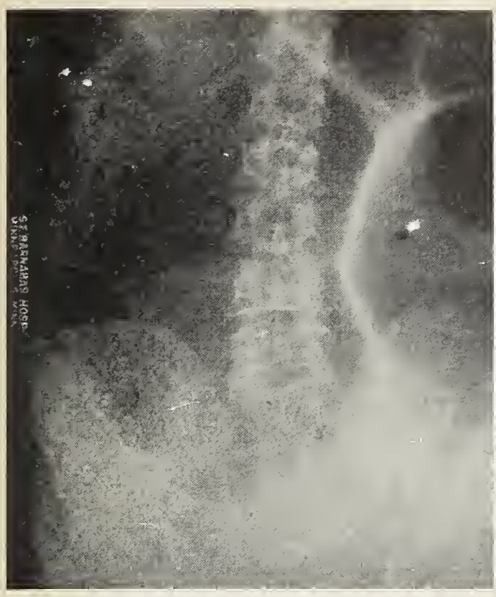

Fig. 4. Case 2. September 13, 1935. Volvulus of sigmoid colon with tremendous air distention of the sigmoid loop. The colon proximal to the volvulus is moderately distended with air and feces. In chronic volvulus the caliber of the distended bowel is much larger than is observed in other obstructive lesions.

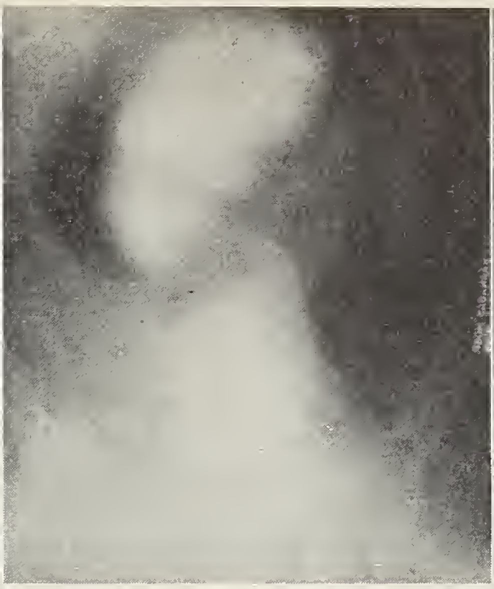

Fig. 5. Case 2. September 13, 1935. Barium enema examination shows the twisting of the recto-sigmoid which is characteristic of volvulus.

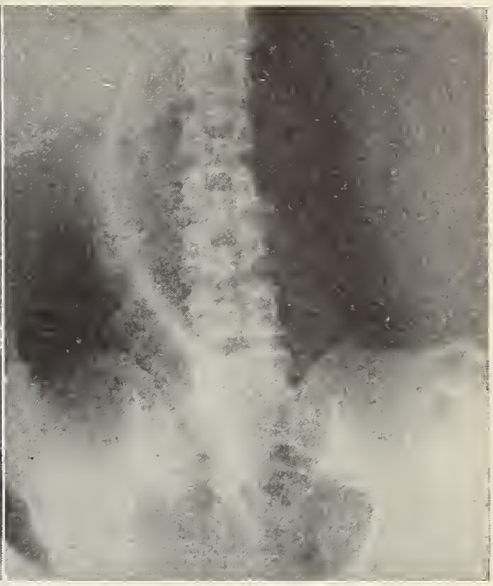

Fig. 6. Case 2. October 26, 1937. Two years after surgical correction of the volvulus, the patient returned and was found to have recurrence of the volvulus. The caliber of the distended sigmoid was larger than was observed in 1935.

The patient had a temperature of 101.8° and pulse 98 the first postoperative day. Temperature 102.6° and pulse 84 on the sixth postoperative day, gradually came down to normal on the seventeenth postoperative day. Several glucose and saline intravenous injections were given after operation. Urine specimens showed faint traces of albumin, a few epithelial, pus and blood cells following operation.

On September 28, 1935, a roentgenogram was made in the antero-posterior direction of the abdomen. There was still evidence of a moderate amount of air in the intestinal tract and this was largely in the colon. The distribution of the air had the appearance of relative adynamic ileus and not obstruction.

The patient remained in comparative good health until September, 1936, when he began having swelling of the ankles, and constipation followed by looseness of the bowels for two or three days. Urine showed a trace of albumin, occasionally epithelial cells and clumps of pus cells. His blood pressure was 124/78, temperature 98.6°, pulse 80. There was a slight murmur of the heart at the apex. The patient had deep-seated varicosity of the legs. The urinary trouble cleared up with urinary antiseptics; bandage to the legs and rest brought improvement. He gained in weight and felt well until October, 1937, when he began having a recurrence of abdominal pain, distention and bowel obstruction. The colon was greatly distended on account of obstruction at or near the sigmoid. His blood pressure at this time was 148/100; urine, acid, few epithelial cells, pus cells 1 to 2 per high-power field.

A radiograph taken October 26, 1937 (Fig. 6), showed a complete obstruction apparently involving the left side of the colon. There was an extremely large loop of gas-filled colon on the left side and distention of the colon proximal to this area but to a much less degree. These findings are fairly typical of volvulus with marked distention of the obstructed loop.

Operation was performed on October 26, 1937. A median incision was made through the old scar, and the abdomen explored and colon followed up its entire length. A megacolon was found obstructed at the upper region of the sigmoid with extreme dilatation of the descending colon and sigmoid about 7 inches in diameter, with a twist at the mesentery forming a volvulus of 360°. The distention was so great that when the loop was relieved of the pressure of the retaining abdominal wall the serosa broke apart in places. The appendix was enlarged but not inflamed. The gallbladder was apparently normal. Gas was let out of the distended loop with a large needle and the volvulus untwisted. A clamp was placed at the upper and lower portion of the redundant and distended loop. The abdominal wall was closed around and below these clamps. The distended loop about 15 inches long was brought over to one side of the abdomen. This loop was removed with cautery the third day following operation. The clamps were gradually loosened. Postoperative treatment consisted of glucose and saline. Temperature was 103° and pulse 120 on the third postoperative day; then gradually came down to normal. On November 9, 1937, a Payers clamp crushed the contiguous walls of the proximal and distal loops of the colon and left in place for three days.

Laboratory report of the tissue removed—about 15 inches of large bowel resected—was as follows: It is greatly dilated (megacolon) filled with gas, blood, serum and liquid fecal matter. The walls are thick with much hemorrhage in the walls. There is considerable necrosis and the mucous membrane is thin. Diagnosis: Megacolon with necrosis of the bowel.

Examination of the urine while in the hospital showed it to be acid 1.003 sp.gr., albumin 0, sugar 0, 20-25 pus cells per high-power field. Hemoglobin 60 per cent.

The patient was irrational at times and had chills, but complained of no pain. The colostomy worked and he had a normal liquid stool. Usually gas and contents escaped from the colostomy opening.

On November 23, 1937, he had a vein ligation on account of the varicose veins of the right leg which bothered him considerably. He convalesced satisfactorily. The colostomy opening worked very well and from the eighth postoperative day he had a normal convalescence. He was discharged from the hospital on November 30, 1937.

After leaving the hospital he had normal bowel movements but some fecal matter passed through the colostomy opening. He gained considerable weight.

His blood pressure was 132/80; hemoglobin 80 per cent. His condition was very good, with no trouble until December, 1937, when he began having some difficulty in evacuating the bowel and considerable protrusion of bowel through the colostomy opening. On January 3, 1938, he was sent to the hospital to have another operation.

On January 4, 1938, the descending portion of the remaining colon protruded through the colostomy opening, obstructing the lumen. The colon was redundant at the distal loop. A left rectus incision was made to the right of the old incision, and loops of colon above and below the opening were anastomosed laterally. The old opening was left. The abdomen was closed in the usual manner. His temperature was 99.6°; pulse 108. Urine: acid, sp.gr. 1.010, albumin 0, sugar 0, 4 to 5 pus cells. Hemoglobin 88 per cent.

Nasal suction was instituted after operation on account of nausea and vomiting, and left in for twelve days. Thereafter he had a normal convalescence, and left the hospital on February 8, 1938.

On April 1, 1939, he felt fine, weighed about 156 pounds, and he had two movements a day through the colostomy opening. There was some bleeding from the opening. His blood pressure was 160/80; temperature 98°; hemoglobin 80 per cent. On April 13 the urine was acid, faint trace of albumin, sugar 0, microscopic negative.

The side anastomosis between the remnant of the descending colon and rectum finally did not function well; consequently the colostomy has not been closed. He wears a special pad to the opening and has established quite a satisfactory regularity of bowel action. He remains in good health; in fact, he stated not long ago that he never felt better, and he has no constitutional trouble that obtained when he was constipated before his operations. He goes about his daily duties with no difficulty, has a good color, his kidneys are in a healthy state, and he seems to enjoy life. He is quite a philosopher and does not mind the inconvenience of the colostomy; in fact, he has not yet been persuaded to have another operation to close the colostomy.

Interesting points in connection with these two cases are:

1. The chronicity, or preceding attacks, of constipation, abdominal distention, cramp-like pains, and, later, diarrhea, with intervals of fairly good health.
2. The dilatation of the bowel and extent of the colon involved.
3. The large firm band present in the first case.
4. The rupture of serosa when pressure was relieved in the second case.
5. Thickness of the intestinal wall in both cases.
6. The amount of necrosis in the second case.
7. The presence of sugar in the urine in both cases at the time of operation and entire disappearance since.
8. The hypertension at the time of operation and reduction at the present time.
9. The great improvement in general health of both patients, and normal bowel action.
10. Two operations performed for the same trouble in the second case.
11. Diverticulosis in the first case.
12. The preceding and associated affections in the two cases.

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Discussion

Dr. Russell Morse, Minneapolis (by invitation): In making a roentgenologic diagnosis of ileus, one is often able to make a differential diagnosis as to the type of ileus and its cause. Under normal conditions the air or gas content of the intestinal tract is small in amount and not sufficient to cause a definite dilatation of the intestine. The normal air content of the small intestine is very slight and is irregular in its distribution. In the colon the air or gas is normally more abundant but is not sufficient to produce dilatation of long segments of the colon. In the study of any case which shows air distention of the colon, with or without air distention of the small intestine, it is safe and advisable to study the colon by means of a barium enema in order to rule out an organic obstruction in the distal part of the colon.

When adynamic (paralytic) ileus occurs, there is gradual accumulation of air throughout the intestinal tract, and there is an equal or proportionate dilatation of the colon and small intestine. A barium enema study safely rules out organic obstruction of the colon.

In dynamic (obstructive) ileus there will be gradual accumulation of air in the intestinal tract proximal to the point of obstruction. The relative involvement of the colon and small intestine will vary with the level of the obstruction. When the obstruction is in the small intestine there will be no dilatation of the colon, although air may be visualized which was present in the colon before the obstruction occurred. If there is dilatation of the colon, the obstruction must be in the colon and a barium enema study will safely disclose the site of the obstruction.

Air distention of the bowel means that there is retention of peristaltic activity. In two conditions we find a diminished air content for quite a period of time. These are mesenteric thrombosis and strangulation of the bowel. In these conditions the shock of the accident must be sufficient to abolish peristaltic activity.

From the roentgenologic study of the two cases presented by Dr. Benjamin, we are able to postulate two findings on which one can make a presumptive diagnosis of volvulus of the colon: (1) the tremendous size of the dilatation, the dilated bowel attaining a transverse diameter of from 10 to 20 centimeters; and (2) the actual corkscrew appearance of the lumen of the colon at the point where it is twisted and as shown by means of the barium enema. These two findings can help us many times in the differential diagnosis.

The meeting adjourned.

A. G. Schulze, M.D.
Secretary.

BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

Tumors of the Hands and Feet. George T. Pack, B.S., M.D., F.A.C.S., Asst. Clinical Professor of Surgery, Yale University School of Medicine, and Cornell University College of Medicine; attending surgeon Memorial Hospital for Cancer and allied diseases. 138 pages. Illus. Price, $3.00, cloth. St. Louis: C. V. Mosby Co., 1939.

Electrocardiographic Patterns. Their diagnostic and Clinical Significance. Arlie R. Barnes, M.D., Mayo Clinic, Rochester, Minnesota. 197 pages. Illus. Price, $5.00, cloth. Springfield, Ill.: Charles C. Thomas, 1939.

A Manual for Diabetic Patients. W. D. Sansum, M.D., Chief of Staff, Sansum Clinic, Director Metabolic Research Santa Barbara Cottage Hospital; Alfred E. Koehler, Ph.D., M.D., Member of Staff Sansum Clinic and Member of Metabolic Research Staff of the Santa Barbara Cottage Hospital, and Ruth Bowden, B.S., Dietitian of the Sansum Clinic, Santa Barbara, California. 227 pages. Illus. Price, $3.25, cloth. New York: The MacMillan Co., 1939.

The 1939 Year Book of General Medicine. Edited by George F. Dick, et al. 848 pages. Illus. Price, $3.00, cloth. Chicago: Year Book Publishers, 1939.

Proctoscopic Examination and Diagnosis and Treatment of Diarrheas. M. H. Streicher, M.S., M.D. Assistant Professor of Medicine, University of Illinois College of Medicine, Research and Education Hospital, and Department of Surgery, Grant Hospital of Chicago. 149 pages. Illus. Price, $3.00, cloth. Springfield, Illinois: Charles C. Thomas, 1939.

PRACTICE OF ALLERGY. Warren T. Vaughan, M.D., Richmond, Va. 1082 pages. Illus. Price, $11.50. St. Louis: C. V. Mosby Co., 1939.

A new book by Warren Vaughan is certain to be of interest to allergists as the author is one of the sound thinkers in the field. The Practice of Allergy published in the spring of 1939 promises to be a classic and will appeal as strongly to the general practitioner interested in allergy as to the specialist.

The volume is full of the author's own clinical ideas, most of which are eminently sound and practical. The book has personality of its own which makes for interesting reading. Its somewhat intimate flavor does not in any way detract from the careful evaluation of the experimental data upon which the study of allergic phenomena rest.

The historical background is well presented in a section dealing with "The Development of Our Present Understanding of Clinical Allergy." Other sections deal with the general characteristics of allergy, the physiology of allergy, allergic diagnosis, food allergy, inhalant allergy, bacteria and fungi.

Finally, about ninety pages are devoted to consider-

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*"Treatment of Acute Anterior Urethritis with Silver Picrate," Knight and Shelanski, American Journal of Syphilis, Gonorrhea and Venereal Diseases, Vol. 23, No. 2, pages 201-206, March, 1939.

JOHN WYETH AND BROTHER, INC. • PHILADELPHIA, PA.

ation of the allergic diseases, including a critical evaluation of the status of allergy in such entities as acne, hypertension and epilepsy.

The arrangement is refreshing but inclusive. The book will well reward those readers seeking either detailed factual data or a general survey of the knowledge of allergy.

Asher A. White, M.D.

OFFICE GYNECOLOGY. J. P. Greenhill, B.S., M.D., F.A.C.S., Prof. of Obstetrics and Gynecology, Loyola University Medical School. Illus. Price $3.00. Chicago: The Year Book Publishers, 1939. 406 pages.

This volume is limited to the office procedures in the practice of gynecology, and is the outgrowth of the author's experiences in teaching at the Cook County Graduate School of Medicine in Chicago.

The author states that the book is intended primarily for general practitioners, but it will also be found to be of equal value to the specialist. The book describes the diagnosis and treatment of the various common gynecologic conditions in a concise and practical manner, no space is wasted in referring to the literature or to controversial matters.

The newer developments are briefly covered, such as Hysterosalpingography, Pneumoperitoneum, Artificial Insemination, Contraception, Schiller's Test, Colposcopic Examinations, et cetera. A simplified Aschheim-Zondek test is described using white mice, which can be easily done in the physician's office where larger laboratories are not available.

The chapter on Endocrinology is particularly practical and easy to understand and is still reasonably complete. There is a chapter on the diagnosis and treatment of the more common ano-rectal diseases which will be of value. The last chapter deals with pre-marital examination and advice. This is one of the most valuable chapters in the book and one that is neglected in most textbooks. Altogether, the book is one of the best of its kind that has ever come to the attention of the reviewer and should be on the desk of every practitioner of gynecology.

James R. Manley, M.D.

THE VITAMINS. A Symposium Arranged Under the Auspices of the Council on Pharmacy and Chemistry and the Council on Foods of the American Medical Association. Imitation leather. Price, $1.50 postpaid. pp. 637. Chicago: American Medical Association, 1939.

So much information has become available about the vitamins, that it is difficult even for experts to keep up with the literature. The present volume is a welcome compendium of authoritative information about these accessory food factors. There are discussions of the chemistry, physiology, pathology, pharmacology and therapeutics, methods of assay, food sources and human requirements of each of the important vitamins. The volume is composed of thirty-one chapters written by experts, and is published under the auspices of the Council on Pharmacy and Chemistry and the Council on Foods of the American Medical Association.

This book should prove to be an indispensable volume for the library of every physician.

MEDICAL STATE BOARD EXAMINATIONS: TOPICAL SUMMARIES AND ANSWERS: AN ORGANIZED REVIEW OF ACTUAL QUESTIONS GIVEN IN MEDICAL LICENSING EXAMINATIONS THROUGHOUT THE UNITED STATES. By Harold Rypins, A.B., M.D., F.A.C.P. Secretary, New York State Board of Medical Examiners; Member, National Board of Medical Examiners, Commission on Graduate Education, Advisory Board for Medical Specialties, Advisory Council on Medical Education; Assistant Professor of Medicine, Albany Medical College; Formerly President, Federation of State Boards of Medical Examiners of the United States; Former Instructor in Medicine, University of Minnesota. Fourth Edition, Revised. Cloth. Price $4.50. pp. 448. Philadelphia, Montreal and London: J. B. Lippincott Company, 1939.

The untimely death of the author of this book shortly after the publication of this edition, brought to a close a life of great usefulness in the fields of internal medicine and medical licensure. Well known in Minnesota through his former teaching connection here, he had spent the last fifteen years of his life in New York State in the active work of licensure and the present volume represents a summary of his experiences therein.

It is far more than a mere "quiz compend" of the older type. It is in reality a very compact and readable synopsis of the accepted facts in the whole realm of medicine and surgery, a volume which could be read profitably by anyone desiring to secure a condensed review of modern ideas in every phase of our work, regardless of whether or not he is contemplating taking an examination for licensure.

Of course, it is intended primarily for the guidance of those preparing themselves for such an examination and for them the author has a most timely and useful outline of advice in Chapter 1, entitled "Personal Foreword to the Candidate." He strongly adjures the prospective applicant to avoid the common practice of considering such an examination as an ordeal to be dreaded, as if the whole purpose of the test were to set at naught all the candidate's years of preparation and try by every trick and scheme to defeat his effort to secure the legal right to practice his profession. The author emphasizes the fact that most candidates tend to overdo their final preparations up to the very last minute, and come into the examination rooms mentally and physically exhausted. He urges a much more common-sense view of the situation and makes his meaning very plain in the four pages of this initial chapter. His ideas are so sound and helpful in this regard that we feel impelled to suggest that every candidate read them and follow the advice offered.

Gilbert Cottam.

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